Engineering Data Manual

Residential
Split Low Silhuoette

LSN DCI Inverter Series

ELECTRA

Indoor Units	Outdoor Units
LSN 25 DCI	ONG 25 DCI
LSN 35 DCI	ONG 35 DCI
LSN 50 DCI	ONG 50 DCI
LSN 60 DCI	GC 60 DCI
LSN 72 DCI	GC 72Z DCI

Refrigerant R410A | Heat Pump

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1. INTRODUCTION

1.1 General

The new LSN DCI INVERTER concealed split unit range comprises the RC (heat pump) models as follow:

- **LSN 25 DCI**
- **LSN 35 DCI**
- **LSN 50 DCI**
- **LSN 60 DCI**
- **LSN 72 DCI**

Remote control compatibility

The LSN DCI unit is compatible with remote controls RC3, RC4, RCW1, RCW2, and RC7.
Unlike standard units (fix RPM) that are selected according to their nominal capacity to overcome the maximum required load; DCI Inverter units can be selected to a smaller nominal capacity range unit.
It made possible due to the ability of inverters to reach a much higher capacity level (indicated as Maximum Capacity) which is around 115-130% of the nominal capacity.

1.2 Main Features

High level DCI inverter system combined with concealed indoor units.
The system consists of high technology DCI Brushless compressor, outdoor and indoor fan motors.
The system adopts new ODP free refrigerant R410A and other environmental regulations such as RoHS, WEEE, etc.
We believe this is the most suitable solution for residential and light commercial air conditioning.
The indoor with only 200 mm height and together with the integrated water pump allows best fit into very low ceiling space.
The units' unique feature is the option of install the unit in horizontal or vertical position without any additional work.
The unit low noise level (up to 25 DBA) fits perfectly for application as hotels, bed room and small offices.

The LSN DCI series benefits from the most advanced technological innovations, namely:

- Variable cooling and heating capacity from 30% to 115% (of rated capacity)
- High COP
- Low noise levels in both indoors and outdoors
- Extreme low silhouette, only 200mm.
- Pre-charged system up to 30m
- Tubing up to 50m length and 30m height difference
- Networking connectivity
- Dry contact output – Alarm
- Ready for base heater and crank case heater installation including software support
- HMI Display consists of 7-segments shows system diagnostics and setup (in some models only)
- Monitoring software (PC port for high level service)
- Operating range cooling: From -10ºC to 46ºC outdoors
- Operating range heating: From -15ºC to 24ºC outdoors

1.3 Indoor Unit

The indoor unit can fit easily to many types of residential and commercials applications.

It includes:

- Water-pump drainage build-in.
- Emergency Water-float to prevent over flow.
- Horizontal/ Vertical installation build in.
- 2 options of return air location, on back of the unit or bellow the unit.
- DC BL motor with maximum fan speed flexibility.
- High technology plastic fan and fan housing.
- Advanced electronic control box assembly with 1-meter cable to allow installation at a more accessible area.

1.4 Filtration

The air filter can be located in the back side or in the bottom of the unit for easy access.

1.5 Control

The microprocessor indoor controller, and an infrared remote control, supplied as standard, provides complete operating function and programming. For further details, please refer to the Operation Manual.

1.6 Outdoor Unit

The outdoor units can be installed as floor or wall mounted units by using a wall-supporting bracket.
The metal sheets are protected by anti- corrosion paintwork allowing long life resistance.
All outdoor units are pre-charged. For further information, please refer to the Product Data Sheet.

It includes:

- Compressor mounted in a soundproofed compartment :
  - **Rotary** – for LSN 25-35
  - **Scroll** – for LSN 50-60-72
- Improved 3- blades axial fans for noise reduction.
- Outdoor coil with hydrophilic fins for RC units optimised for operation with R 410A refrigerant.
- Fan grill air outlet.
- Service valves" flare" type connection.
- Interconnecting wiring terminal block.

1.7 Tubing Connections

Flare type-interconnecting tubing to be produced on site.
For further details, please refer to the Installation Manual.

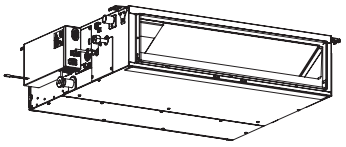
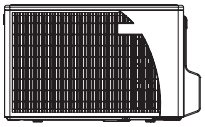
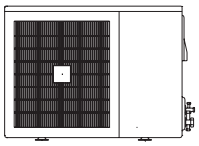
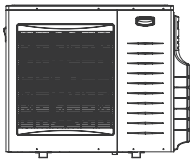
1.8 Accessories

RCW Wall Mounted Remote Control
The RCW remote control is mounted on the wall, and controls the unit either as an infrared remote control or as a wired controller. The wired controller can control up to 10 Indoor units with the same program settings and adjustments. For further details, please refer to the Technical Service Manual.

1.9 Inbox Documentation

Each unit is supplied with its own installation and operation manuals.

1.10 Matching Table

Outdoor Units			Indoor Units				
							
	Model	**Refr"**	**LSN 25 DCI**	**LSN 35 DCI**	**LSN 50 DCI**	**LSN 60 DCI**	**LSN 72 DCI**
	ONG 25 DCI	R410A	✓				
	ONG 35 DCI	R410A		✓			
	ONG 50 DCI	R410A			✓		
	GC 60 DCI	R410A				✓	
	GC 72Z DCI	R410A					✓

2. PRODUCT DATA SHEET

2.1 LSN 25 DCI

Model Indoor Unit				**LSN 25 DCI**	
Model Outdoor Unit				**ONG 25 DCI R410A**	
Installation method of Pipe				DUCTED	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	8500 (4780-12280)	11600 (5120-17060)
			kW	2.5 (1.40-3.60)	3.4 (1.50-5.0)
Power input (1)			kW	0.625	0.87
EER (Cooling) or COP (Heating) (1)			W/W	4.0	3.9
Energy efficiency class				A	A
Power supply			V/Ph/Hz	220-240/1/50	
Rated current			A	2.7	3.6
Starting current			A	10.5	
Circuit breaker rating			A	16	
INDOOR	Fan type & quantity			Centrifugal & 2	
	Fan speeds	H/ M/ L	RPM	920/810/740	
	Air flow (2)	H/ M/ L	m³/hr	620/560/490	
	External static pressure	Min-Max	Pa	0-30	
	Sound power level (3)	H/ M/ L	dB(A)	50/47/44	
	Sound pressure level (4)	H/ M/ L	dB(A)	29/26/23	
	Moisture removal		L/hr	0.5	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	750x630x200	
	Weight		kg	20	
	Package dimensions	WxHxD	mm	885x695x226	
	Packaged weight		kg	23	
	Units per pallet		Units	14	
	Stacking height		Units	7	
INDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			DC Inverter single rotary	
	Fan type & quantity			Axial & 1	
	Air flow	H / L	m³/hr	1780	
	Sound power level	H / L	dB(A)	60	
	Sound pressure level (4)	H / L	dB(A)	50	
	Dimensions	WxHxD	mm	795x610x290	
	Weight		kg	38	
	Package dimensions	WxHxD	mm	945x655x395	
	Packaged weight		kg	41	
	Units per pallet		Units	9	
	Stacking height		Units	3	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg	1.1	
	Additional charge per 1 meter		g/m	No need	
	Connections between units	Liquid line	In.	1/4”	
		Suction line	In.	3/8”	
		Max. tubing length	m.	20	
		Max. height difference	m.	15	
Operation control type				I.R Remote control	
Heating elements			kW		
Others					

(1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
(2) Airflow without external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1-meter distance from unit.

2.2 LSN 35 DCI

Model Indoor Unit				**LSN 35 DCI**	
Model Outdoor Unit				**ONG 35 DCI R410A**	
Installation method of Pipe				DUCTED	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	11940 (4780-14670)	14670 (5100-19790)
			kW	3.5 (1.40-4.30)	4.3 (1.50-5.8)
Power input (1)			kW	0.95	1.16
EER (Cooling) or COP (Heating) (1)			W/W	3.67	3.62
Energy efficiency class				A	A
Power supply			V/Ph/Hz	220-240/1/50	
Rated current			A	3.67	4.8
Starting current			A	10.5	
Circuit breaker rating			A	16	
INDOOR	Fan type & quantity			Centrifugal & 2	
	Fan speeds	H/ M/ L	RPM	980/860/730	
	Air flow (2)	H/ M/ L	m³/hr	650/580/490	
	External static pressure	Min-Max	Pa	0-30	
	Sound power level (3)	H/ M/ L	dB(A)	53/49/45	
	Sound pressure level (4)	H/ M/ L	dB(A)	31/27/24	
	Moisture removal		L/hr	1.0	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	200x750x630	
	Weight		kg	20	
	Package dimensions	WxHxD	mm	885x695x226	
	Packaged weight		kg	23	
	Units per pallet		Units	14	
	Stacking height		Units	7	
INDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			DC Inverter single rotary	
	Fan type & quantity			Axial & 1	
	Air flow	H / L	m³/hr	1780	
	Sound power level	H / L	dB(A)	62	
	Sound pressure level (4)	H / L	dB(A)	52	
	Dimensions	WxHxD	mm	795x610x290	
	Weight		kg	38	
	Package dimensions	WxHxD	mm	945x655x395	
	Packaged weight		kg	43	
	Units per pallet		Units	9	
	Stacking height		Units	3	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg	1.2	
	Additional charge per 1 meter		g/m	No need	
	Connections between units	Liquid line	In.	1/4”	
		Suction line	In.	3/8”	
		Max. tubing length	m.	20	
		Max. height difference	m.	15	
Operation control type				I.R Remote control	
Heating elements			kW		
Others					

(1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
(2) Airflow without external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1-meter distance from unit.

2.3 LSN 50 DCI

Model Indoor Unit				**LSN 50 DCI**	
Model Outdoor Unit				**ONG 50 DCI R410A**	
Installation method of Pipe				DUCTED	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	17060 (5120-20470)	20470 (5120-25930)
			kW	5.0 (1.50-6.00)	6.0 (1.50-7.60)
Power input (1)			kW	1.5	1.73
EER (Cooling) or COP (Heating) (1)			W/W	3.03	3.47
Energy efficiency class				A	A
Power supply			V/Ph/Hz	220-240/1/50	
Rated current			A	6.5	7.6
Starting current			A	10.5	
Circuit breaker rating			A	20	
INDOOR	Fan type & quantity			Centrifugal & 2	
	Fan speeds	H/ M/ L	RPM	1100/980/860	
	Air flow (2)	H/ M/ L	m³/hr	710/600/540	
	External static pressure	Min-Max	Pa	0-40	
	Sound power level (3)	H/ M/ L	dB(A)	54/51/48	
	Sound pressure level (4)	H/ M/ L	dB(A)	35/32/29	
	Moisture removal		L/hr	1.5	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	750x630x200	
	Weight		kg	21	
	Package dimensions	WxHxD	mm	885x695x226	
	Packaged weight		kg	24	
	Units per pallet		Units	14	
	Stacking height		Units	7	
INDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			Scroll, DC	
	Fan type & quantity			Axial & 1	
	Air flow	H / L	m³/hr	2160	
	Sound power level	H / L	dB(A)	63	
	Sound pressure level (4)	H / L	dB(A)	53	
	Dimensions	WxHxD	mm	795x610x290	
	Weight		kg	39	
	Package dimensions	WxHxD	mm	945x655x395	
	Packaged weight		kg	43	
	Units per pallet		Units	9	
	Stacking height		Units	3	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg	1.5	
	Additional charge per 1 meter		g/m	No need	
	Connections between units	Liquid line	In.	1/4”	
		Suction line	In.	1/2”	
		Max. tubing length	m.	30	
		Max. height difference	m.	15	
Operation control type				I.R Remote control	
Heating elements			kW		
Others					

(1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
(2) Airflow without external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1-meter distance from unit.

2.4 LSN 60 DCI

Model Indoor Unit				**LSN 60 DCI**	
Model Outdoor Unit				**ONG 60 DCI R410A**	
Installation method of Pipe				DUCTED	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	20800 (5120-22860)	22520 (5120-26950)
			kW	6.1 (1.50-6.70)	6.6 (1.50-7.90)
Power input (1)			kW	1.9	1.7
EER (Cooling) or COP (Heating) (1)			W/W	3.25	3.81
Energy efficiency class				A	A
Power supply			V/Ph/Hz	220-240/1/50	
Rated current			A	8.2	7.8
Starting current			A	15	
Circuit breaker rating			A	20	
INDOOR	Fan type & quantity			Centrifugal & 3	
	Fan speeds	H/ M/ L	RPM	1170/1050/960	
	Air flow (2)	H/ M/ L	m³/hr	1100/950/880	
	External static pressure	Min-Max	Pa	0-40	
	Sound power level (3)	H/ M/ L	dB(A)	59/55/53	
	Sound pressure level (4)	H/ M/ L	dB(A)	38/34/32	
	Moisture removal		L/hr	1.7	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	1050x630x200	
	Weight		kg	25	
	Package dimensions	WxHxD	mm	1185x695x226	
	Packaged weight		kg	28	
	Units per pallet		Units	14	
	Stacking height		Units	7	
INDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			Scroll	
	Fan type & quantity			Axial & 1	
	Air flow	H / L	m³/hr	2860	
	Sound power level	H / L	dB(A)	65	
	Sound pressure level (4)	H / L	dB(A)	55	
	Dimensions	WxHxD	mm	846x690x302	
	Weight		kg	46	
	Package dimensions	WxHxD	mm	990x770x430	
	Packaged weight		kg	50	
	Units per pallet		Units	9	
	Stacking height		Units	3	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg	1.65	
	Additional charge per 1 meter		g/m	No need	
	Connections between units	Liquid line	In.	1/4”	
		Suction line	In.	1/2”	
		Max. tubing length	m.	30	
		Max. height difference	m.	15	
Operation control type				I.R Remote control	
Heating elements			kW		
Others					

(1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
(2) Airflow without external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1-meter distance from unit.

2.5 LSN 72 DCI

Model Indoor Unit				**LSN 72 DCI**	
Model Outdoor Unit				**GC 72Z DCI R410A**	
Installation method of Pipe				DUCTED	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	23880 (5120-25600)	25420 (5120-30020)
			kW	7.0 (1.50-7.50)	7.45 (1.50-8.80)
Power input (1)			kW	2.1	2.1
EER (Cooling) or COP (Heating) (1)			W/W	3.4	3.68
Energy efficiency class				A	A
Power supply			V/Ph/Hz	220-240/1/50	
Rated current			A	9.3	9.3
Starting current			A	15	
Circuit breaker rating			A	20	
INDOOR	Fan type & quantity			Centrifugal & 3	
	Fan speeds	H/ M/ L	RPM	1200/1050/980	
	Air flow (2)	H/ M/ L	m³/hr	1150/950/900	
	External static pressure	Min-Max	Pa	0-40	
	Sound power level (3)	H/ M/ L	dB(A)	63/59/56	
	Sound pressure level (4)	H/ M/ L	dB(A)	39/35/32	
	Moisture removal		L/hr	2.0	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	1050x630x200	
	Weight		kg	25	
	Package dimensions	WxHxD	mm	1185x695x226	
	Packaged weight		kg	28	
	Units per pallet		Units	14	
	Stacking height		Units	7	
INDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			Twin rotary	
	Fan type & quantity			Axial & 1	
	Air flow	H / L	m³/hr	3600	
	Sound power level	H / L	dB(A)	66	
	Sound pressure level (4)	H / L	dB(A)	56	
	Dimensions	WxHxD	mm	950x835x412	
	Weight		kg	65.5	
	Package dimensions	WxHxD	mm	1080x910x477	
	Packaged weight		kg	73	
	Units per pallet		Units	2	
	Stacking height		Units	2	
	Refrigerant type			R410A	
	Refrigerant charge (standard connecting tubing length)		kg	2.3	
	Additional charge per 1 meter		g/m	7.5m<Length≤20m:+0g; 20m<Length≤30m:+300g; 30m <Length≤50m; +1500g	
	Connections between units	Liquid line	In.	3/8”	
		Suction line	In.	5/8”	
		Max. tubing length	m.	50	
		Max. height difference	m.	30	
Operation control type				I.R Remote control	
Heating elements			kW		
Others					

(1) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).
(2) Airflow without external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1-meter distance from unit.

3. RATING CONDITIONS

Standard conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.

Cooling:
Indoor: 27ºC DB 19ºC WB
Outdoor: 35ºC DB

Heating:
Indoor: 20ºC DB
Outdoor: 7ºC DB 6ºC WB

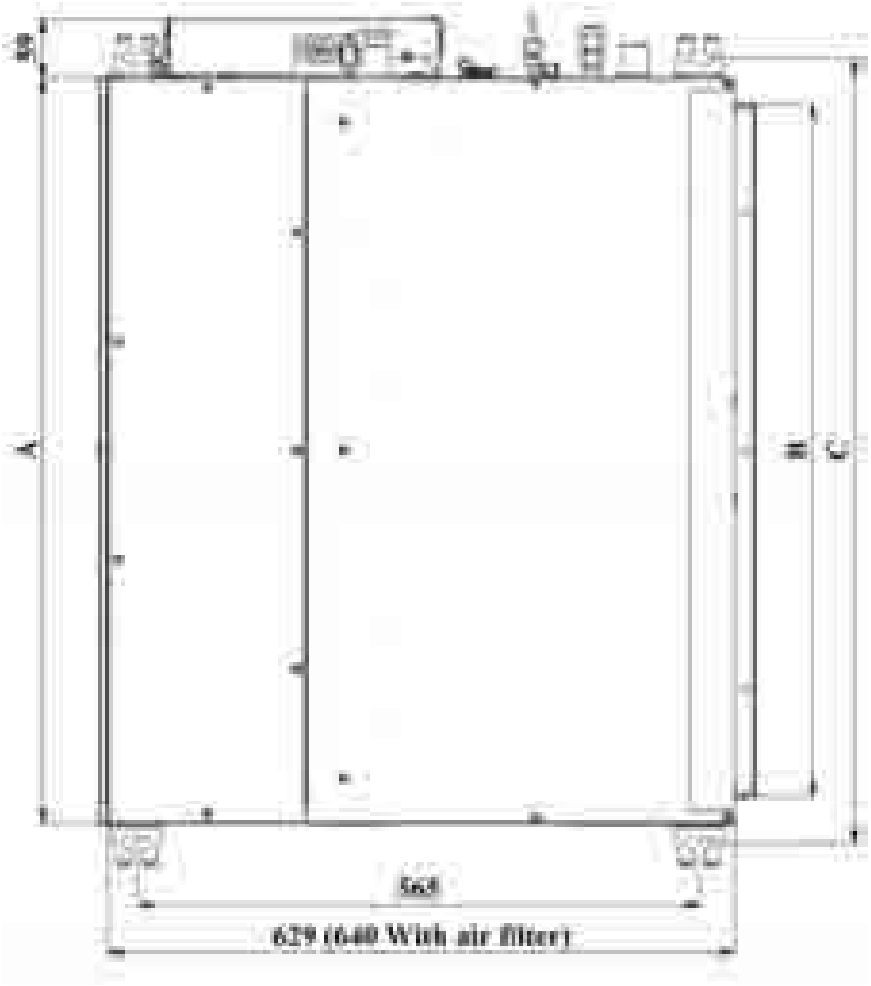
3.1 Operating Limits

3.1.1 R410A

		Indoor	Outdoor
Cooling	Upper limit	32ºC DB 23ºC WB	46ºC DB
	Lower limit	21ºC DB 15ºC WB	-10ºC DB
Heating	Upper limit	27ºC DB	24ºC DB/18ºC WB
	Lower limit	20ºC DB	-15ºC DB/-16ºC WB
Voltage	1 PH	198 – 264 V	

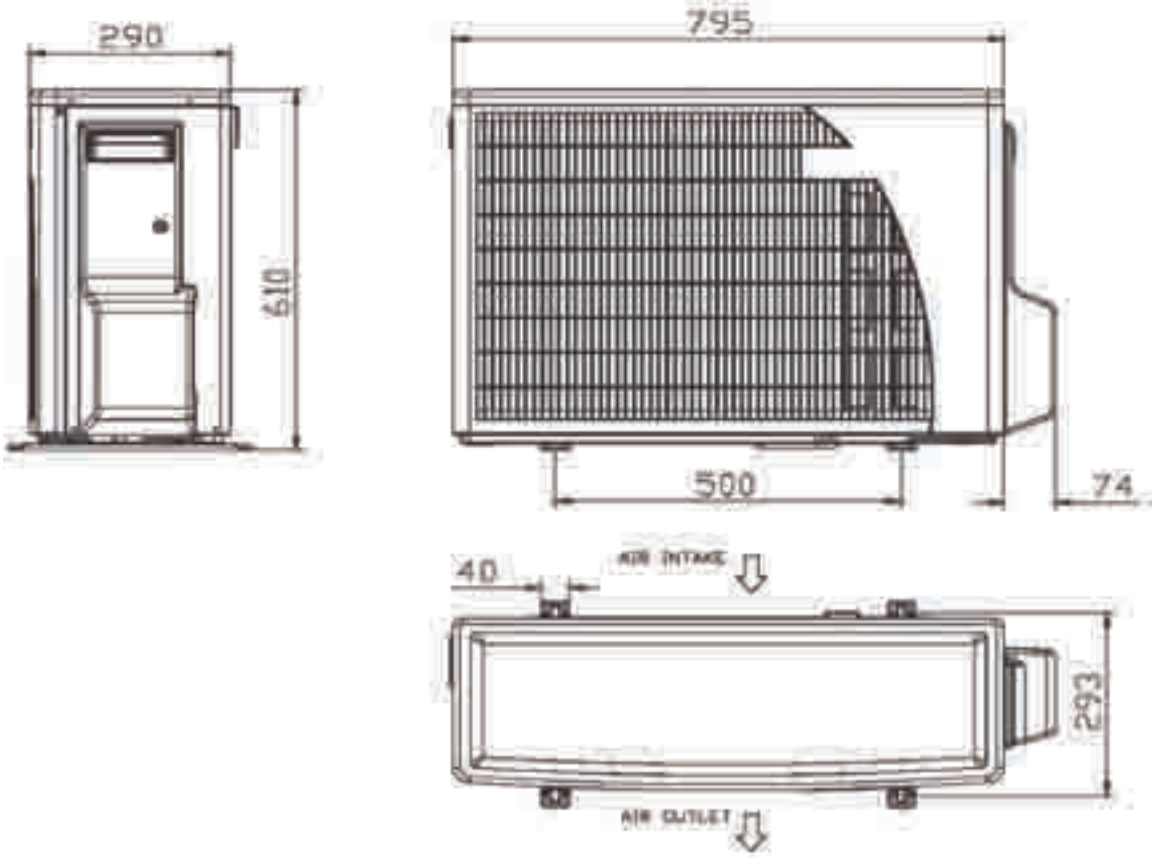
4. OUTLINE DIMENSIONS

4.1 Indoor Unit: LSN 25, 35, 50, 60, 72 DCI

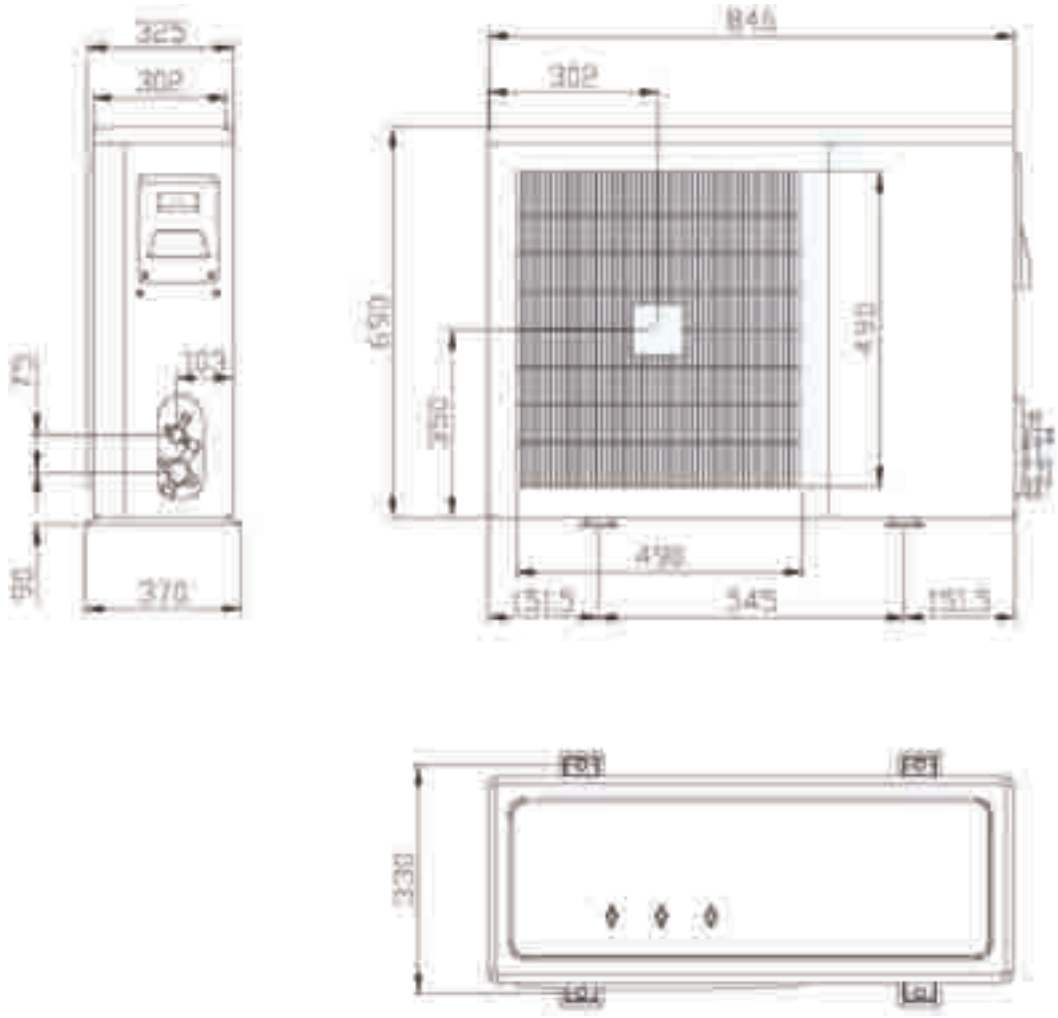


Nominal Capacity	A	B	C
2.5 -5.0 kW	750	696	790
6.0-7.2 kW	1050	996	1090

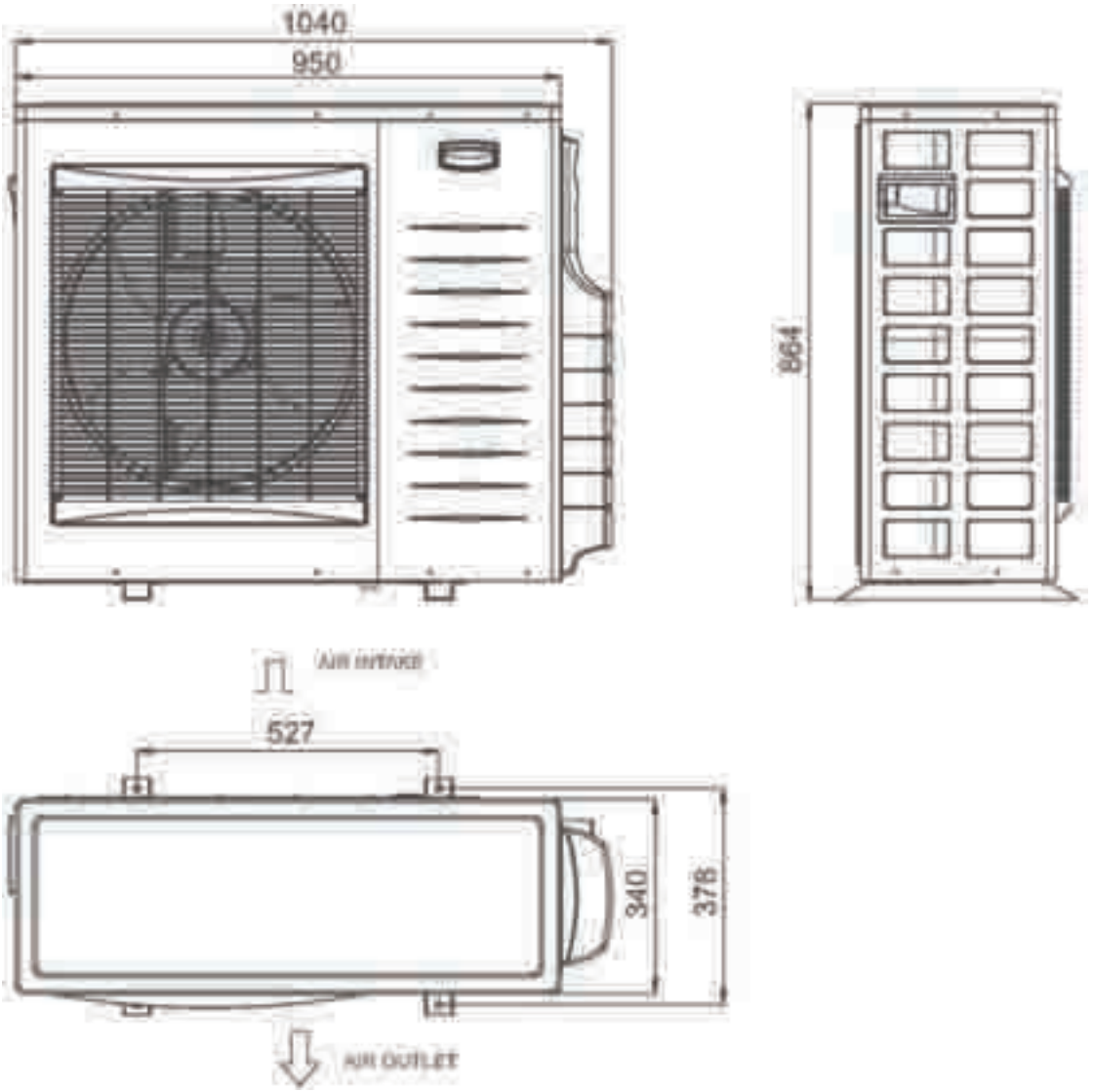
4.2 Outdoor Unit: ONG 25, 35, 50 DCI



4.3 Indoor Unit: GC 60 DCI



4.4 Outdoor Unit: GC 72Z DCI



5. PERFORMANCE DATA

5.1 LSN 25 DCI

5.1.1 Cooling Capacity (kW) - Run Mode

OD COIL ENTERING AIR DB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [ºC]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	2.42	2.57	2.73	2.89	3.05
	SC	2.02	2.06	2.10	2.14	2.18
	PI	0.49	0.50	0.51	0.52	0.52
30	TC	2.30	2.46	2.62	2.77	2.93
	SC	1.97	2.01	2.05	2.09	2.13
	PI	0.54	0.55	0.56	0.57	0.58
35	TC	2.18	2.34	**2.50**	2.66	2.82
	SC	1.92	1.96	**2.00**	2.04	2.08
	PI	0.60	0.61	**0.62**	0.63	0.64
40	TC	2.07	2.23	2.38	2.54	2.70
	SC	1.87	1.91	1.95	1.99	2.03
	PI	0.66	0.67	0.68	0.69	0.70
46	TC	1.93	2.09	2.24	2.40	2.56
	SC	1.81	1.85	1.89	1.93	1.97
	PI	0.73	0.74	0.75	0.75	0.76

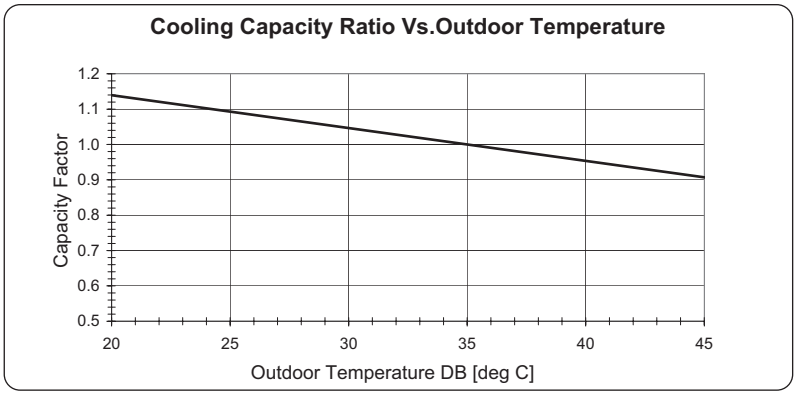
LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW

DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)

ID Indoor
OU Outdoor

5.1.2 Capacity Correction Factors



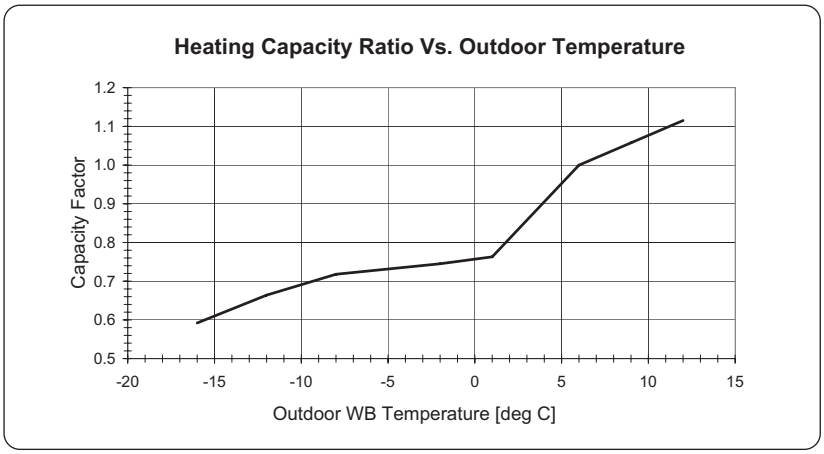
5.1.3 Heating Capacity (kW) - Run Mode

OD COIL ENTERING AIR DB/WB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [ºC]		
		15	20	25
-15/ -16	TC	2.16	2.01	1.86
	PI	0.52	0.58	0.63
-10/ -12	TC	2.41	2.26	2.11
	PI	0.63	0.68	0.74
-7/ -8	TC	2.59	2.44	2.29
	PI	0.71	0.76	0.82
-1/ -2	TC	2.68	2.53	2.38
	PI	0.78	0.83	0.88
2/1	TC	2.75	2.59	2.44
	PI	0.82	0.87	0.92
7/6	TC	3.55	**3.40**	3.25
	PI	0.82	**0.87**	0.92
10/9	TC	3.75	3.60	3.44
	PI	0.87	0.92	0.97
15/12	TC	3.94	3.79	3.64
	PI	0.91	0.97	1.02
15-24 (protection range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW
DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)
ID Indoor
OU Outdoor

5.1.4 Capacity Correction Factors



5.2 LSN 35 DCI

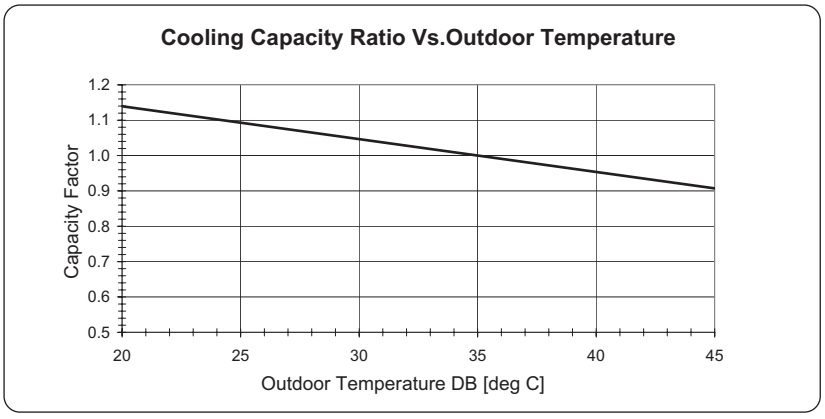
5.2.1 Cooling Capacity (kW) - Run Mode

OD COIL ENTERING AIR DB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [ºC]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	3.38	3.60	3.83	4.05	4.27
	SC	2.76	2.81	2.87	2.93	2.98
	PI	0.75	0.76	0.78	0.79	0.80
30	TC	3.22	3.44	3.66	3.88	4.11
	SC	2.69	2.74	2.80	2.86	2.91
	PI	0.83	0.85	0.86	0.88	0.89
35	TC	3.06	3.28	**3.50**	3.72	3.94
	SC	2.62	2.67	**2.73**	2.79	2.84
	PI	0.92	0.94	**0.95**	0.96	0.98
40	TC	2.89	3.12	3.34	3.56	3.78
	SC	2.55	2.60	2.66	2.72	2.77
	PI	1.01	1.02	1.04	1.05	1.07
46	TC	2.70	2.92	3.14	3.36	3.58
	SC	2.46	2.52	2.58	2.63	2.69
	PI	1.11	1.13	1.14	1.16	1.17

LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW
DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)
ID Indoor
OU Outdoor

5.2.2 Capacity Correction Factors



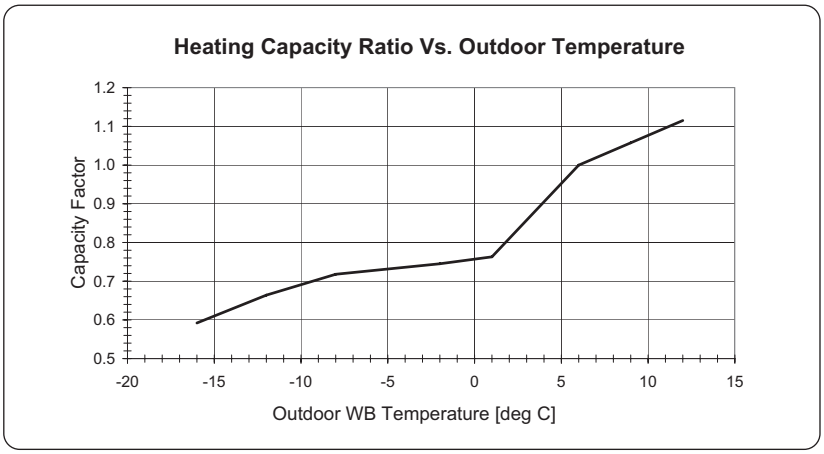
5.2.3 Heating Capacity (kW) - Run Mode

OD COIL ENTERING AIR DB/WB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [ºC]		
		15	20	25
-15/ -16	TC	2.67	2.49	2.30
	PI	0.70	0.77	0.84
-10/ -12	TC	2.98	2.79	2.60
	PI	0.84	0.91	0.98
-7/ -8	TC	3.20	3.02	2.83
	PI	0.95	1.02	1.09
-1/ -2	TC	3.32	3.13	2.94
	PI	1.00	1.07	1.14
2/1	TC	3.39	3.20	3.02
	PI	1.04	1.11	1.18
7/6	TC	4.39	**4.20**	4.01
	PI	1.09	**1.16**	1.23
10/9	TC	4.63	4.44	4.26
	PI	1.15	1.23	1.30
15/12	TC	4.87	4.68	4.50
	PI	1.22	1.29	1.36
15-24 (protection range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW
DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)
ID Indoor
OU Outdoor

5.2.4 Capacity Correction Factors



5.3 LSN 50 DCI

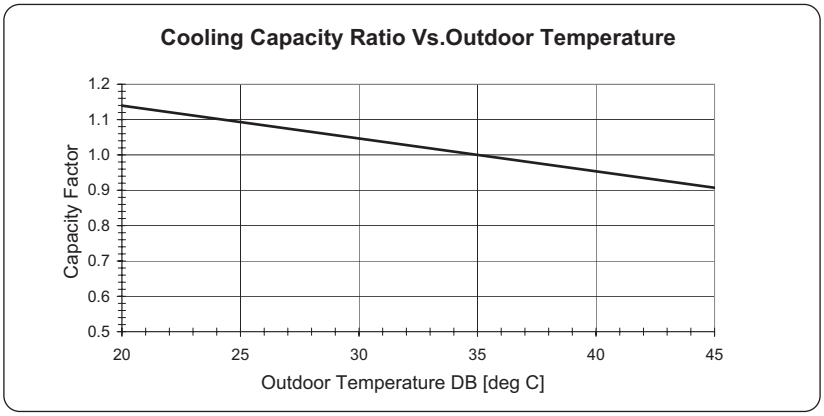
5.3.1 Cooling Capacity (kW) - Run Mode

OD COIL ENTERING AIR DB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [ºC]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	4.83	5.15	5.47	5.78	6.10
	SC	3.74	3.81	3.89	3.96	4.04
	PI	1.18	1.20	1.22	1.25	1.27
30	TC	4.60	4.92	5.23	5.55	5.86
	SC	3.64	3.72	3.79	3.87	3.95
	PI	1.32	1.34	1.36	1.38	1.41
35	TC	4.37	4.68	**5.00**	5.32	5.63
	SC	3.55	3.62	**3.70**	3.78	3.85
	PI	1.46	1.48	**1.50**	1.52	1.55
40	TC	4.14	4.45	4.77	5.08	5.40
	SC	3.45	3.53	3.61	3.68	3.76
	PI	1.59	1.62	1.64	1.66	1.68
46	TC	3.86	4.17	4.49	4.80	5.12
	SC	3.34	3.42	3.49	3.57	3.64
	PI	1.76	1.78	1.80	1.83	1.85

LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW
DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)
ID Indoor
OU Outdoor

5.3.2 Capacity Correction Factors



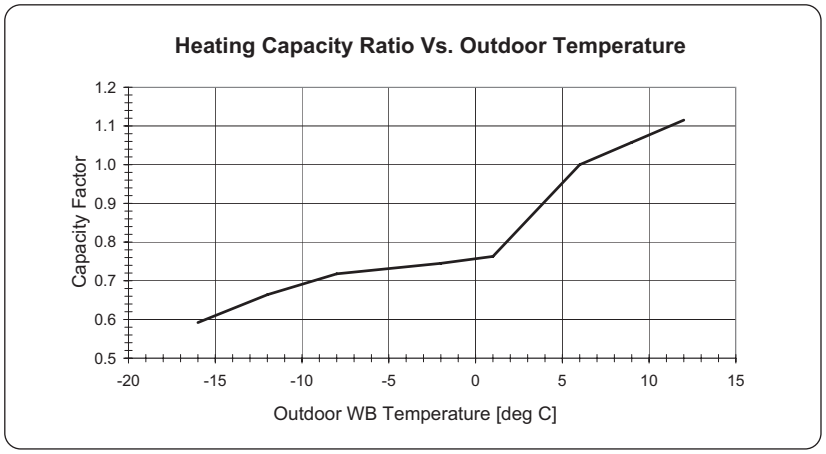
5.3.3 Heating Capacity (kW) - Run Mode

OD COIL ENTERING AIR DB/WB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [ºC]		
		15	20	25
-15/ -16	TC	3.88	3.61	3.34
	PI	1.04	1.14	1.25
-10/ -12	TC	4.32	4.05	3.78
	PI	1.25	1.36	1.46
-7/ -8	TC	4.65	4.38	4.11
	PI	1.41	1.52	1.62
-1/ -2	TC	4.82	4.54	4.27
	PI	1.49	1.60	1.70
2/1	TC	4.93	4.65	4.38
	PI	1.54	1.65	1.76
7/6	TC	6.37	**6.00**	5.83
	PI	1.62	**1.73**	1.84
10/9	TC	6.72	6.45	6.18
	PI	1.72	1.83	1.93
15/12	TC	7.07	6.80	6.53
	PI	1.82	1.92 2.03	
15-24 (protection range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW
DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)
ID Indoor
OU Outdoor

5.3.4 Capacity Correction Factors



5.4 LSN 60 DCI

5.4.1 Cooling Capacity (kW)

OD COIL ENTERING AIR DB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [ºC]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	5.80	6.18	6.56	6.94	7.32
	SC	4.73	4.82	4.92	5.02	5.11
	PI	1.48	1.51	1.53	1.56	1.59
30	TC	5.52	5.90	6.28	6.66	7.04
	SC	4.61	4.70	4.80	4.90	4.99
	PI	1.65	1.68	1.71	1.74	1.76
35	TC	5.24	5.62	**6.10**	6.38	6.76
	SC	4.49	4.58	**4.68**	4.78	4.87
	PI	1.82	1.85	**1.88**	1.91	1.94
40	TC	4.96	5.34	5.72	6.10	6.48
	SC	4.37	4.46	4.56	4.66	4.75
	PI	2.00	2.02	2.05	2.08	2.11
46	TC	4.63	5.01	5.39	5.77	6.14
	SC	4.22	4.32	4.42	4.51	4.61
	PI	2.20	2.23	2.26	2.29	2.32

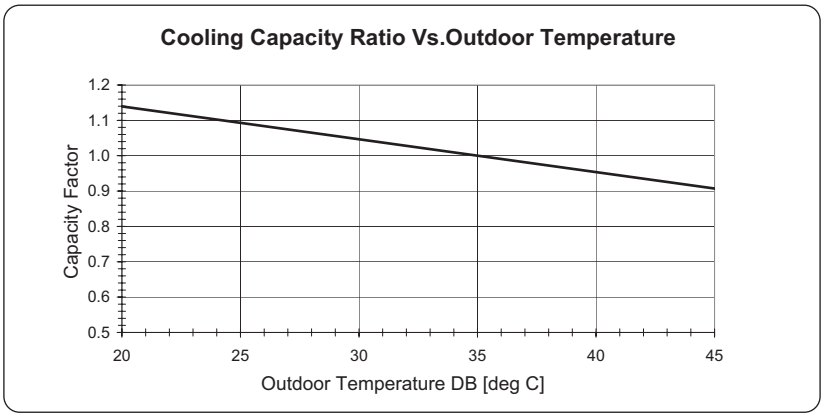
LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW

DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)

ID Indoor
OU Outdoor

5.4.2 Capacity Correction Factors



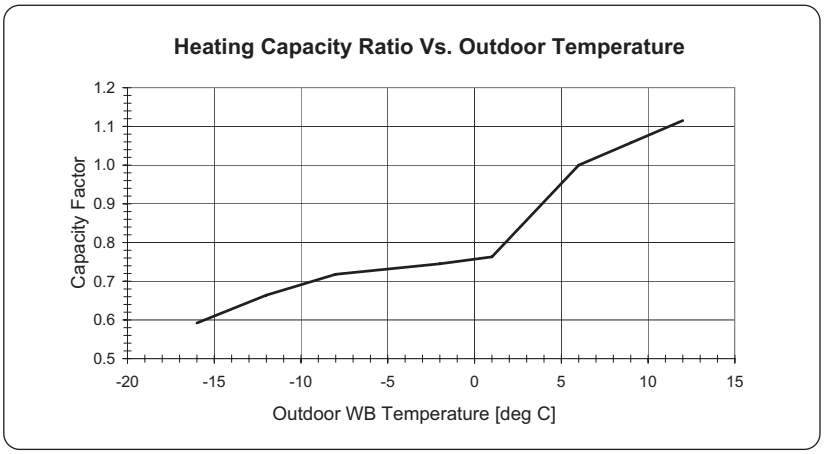
5.4.3 Heating

OD COIL ENTERING AIR DB/WB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [ºC]		
		15	20	25
-15/ -16	TC	4.20	3.91	3.61
	PI	1.04	1.14	1.26
-10/ -12	TC	4.68	4.38	4.09
	PI	1.25	1.36	1.46
-7/ -8	TC	5.03	4.74	4.45
	PI	1.41	1.52	1.62
-1/ -2	TC	5.21	4.92	4.62
	PI	1.49	1.60	1.70
2/1	TC	5.33	5.04	4.74
	PI	1.54	1.65	1.76
7/6	TC	6.89	**6.60**	6.31
	PI	1.62	**1.73**	1.84
10/9	TC	7.27	6.98	6.69
	PI	1.72	1.83	1.93
15/12	TC	7.65	7.36	7.07
	PI	1.82	1.92	2.03
15-24 (protection range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW
DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)
ID Indoor
OU Outdoor

5.4.4 Capacity Correction Factors



5.5 LSN 72 DCI

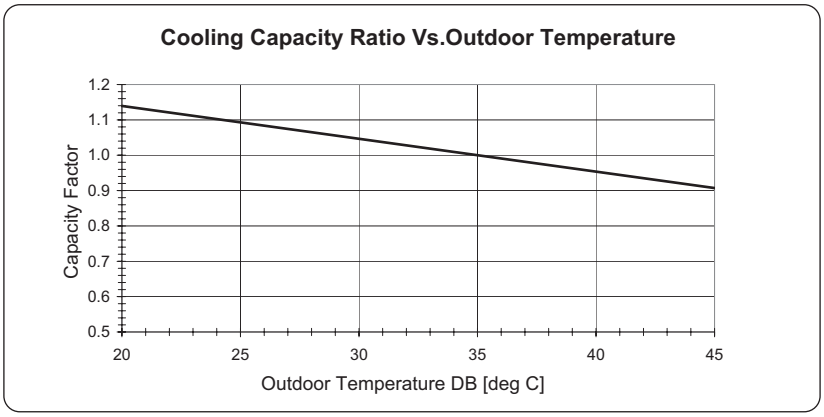
5.5.1 Cooling Capacity (kW)

OD COIL ENTERING AIR DB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [ºC]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	6.77	7.21	7.65	8.09	8.54
	SC	5.51	5.63	5.74	5.85	5.96
	PI	1.61	1.64	1.67	1.70	1.73
30	TC	6.44	6.88	7.33	7.77	8.21
	SC	5.37	5.49	5.60	5.71	5.82
	PI	1.80	1.83	1.86	1.89	1.92
35	TC	6.12	6.56	**7.00**	7.44	7.88
	SC	5.24	5.35	**5.46**	5.57	5.68
	PI	1.99	2.02	**2.05**	2.08	2.11
40	TC	5.79	6.23	6.67	7.12	7.56
	SC	5.10	5.21	5.32	5.43	5.55
	PI	2.18	2.21	2.24	2.27	2.30
46	TC	5.40	5.84	6.28	6.73	7.17
	SC	4.93	5.04	5.15	5.27	5.38
	PI	2.40	2.43	2.46	2.50	2.53

LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW
DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)
ID Indoor
OU Outdoor

5.5.2 Capacity Correction Factors



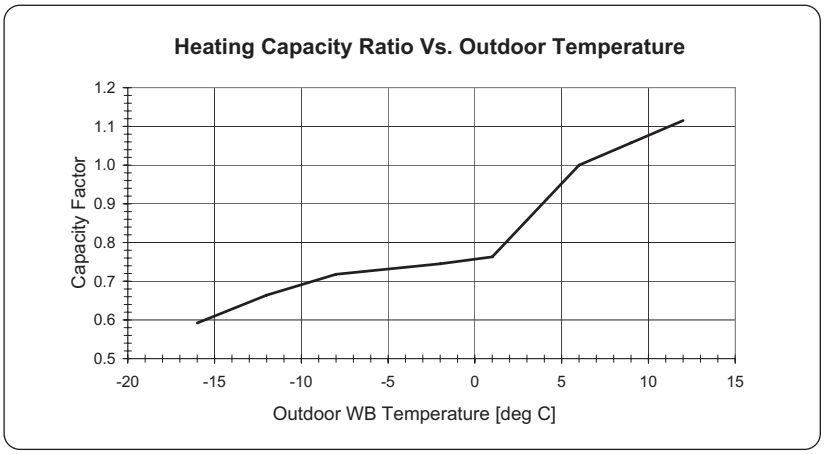
5.5.3 Heating

OD COIL ENTERING AIR DB/WB TEMPERATURE [Cº]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [ºC]		
		15	20	25
-15/ -16	TC	7.74	4.41	4.08
	PI	1.21	1.34	1.46
-10/ -12	TC	5.28	4.95	4.62
	PI	1.46	1.58	1.71
-7/ -8	TC	5.68	5.35	5.02
	PI	1.65	1.77	1.89
-1/ -2	TC	5.88	5.55	5.22
	PI	1.74	1.86	1.99
2/1	TC	6.02	5.68	5.35
	PI	1.80	1.93	2.05
7/6	TC	7.78	**7.45**	7.12
	PI	1.90	**2.02**	2.14
10/9	TC	8.21	7.88	7.55
	PI	2.01	2.13	2.26
15/12	TC	8.64	8.31	7.98
	PI	2.12	2.25	2.37
15-24 (protection range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

TC Total Cooling Capacity, kW
SC Sensible Capacity, kW
PI Power Input, kW
DB Dry Bulb Temp., (ºC)
WB Wet Bulb Temp., (ºC)
ID Indoor
OU Outdoor

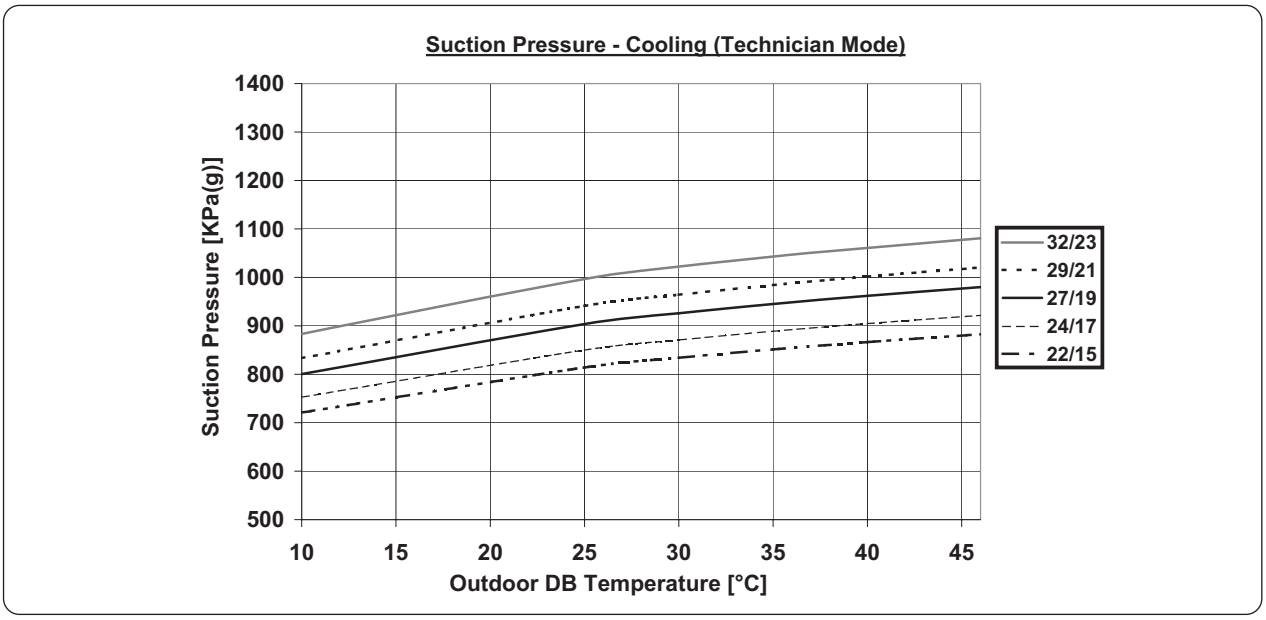
5.5.4 Capacity Correction Factors

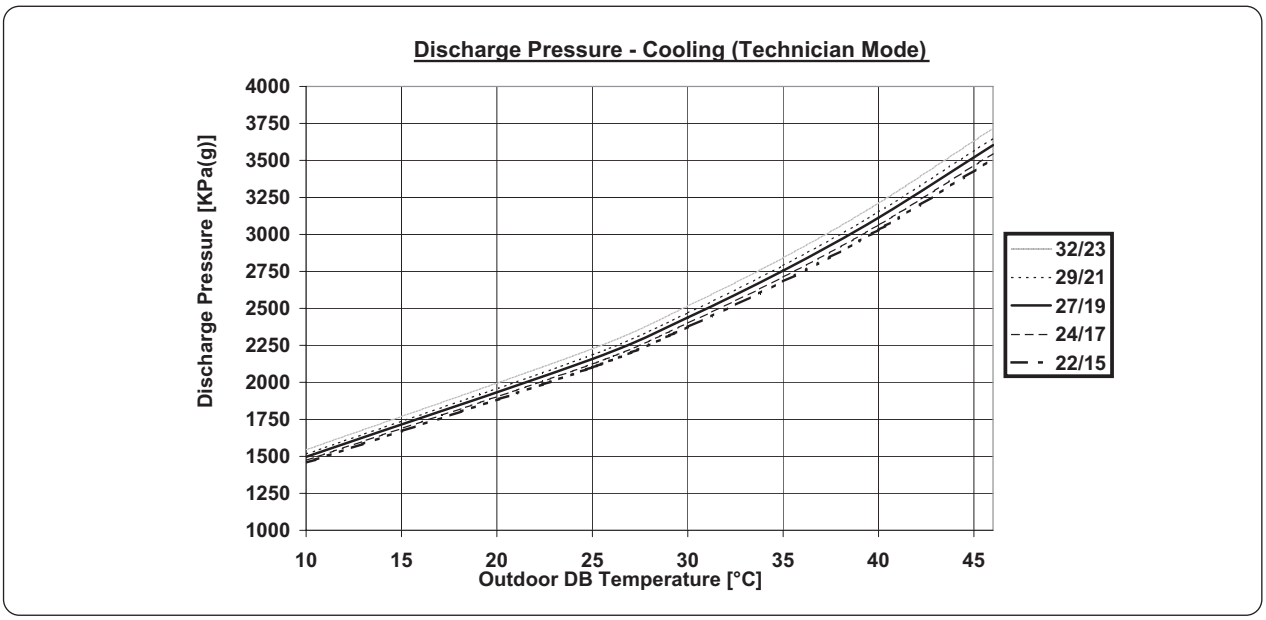


6. PRESSURE CURVES

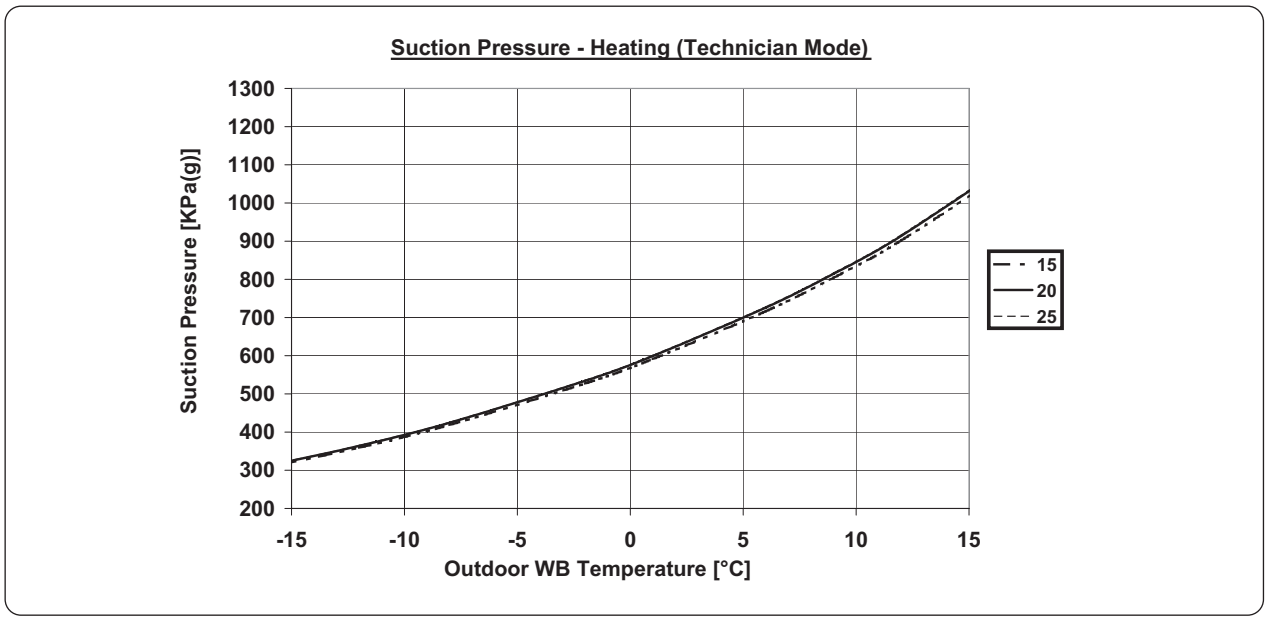
6.1 LSN 25 DCI

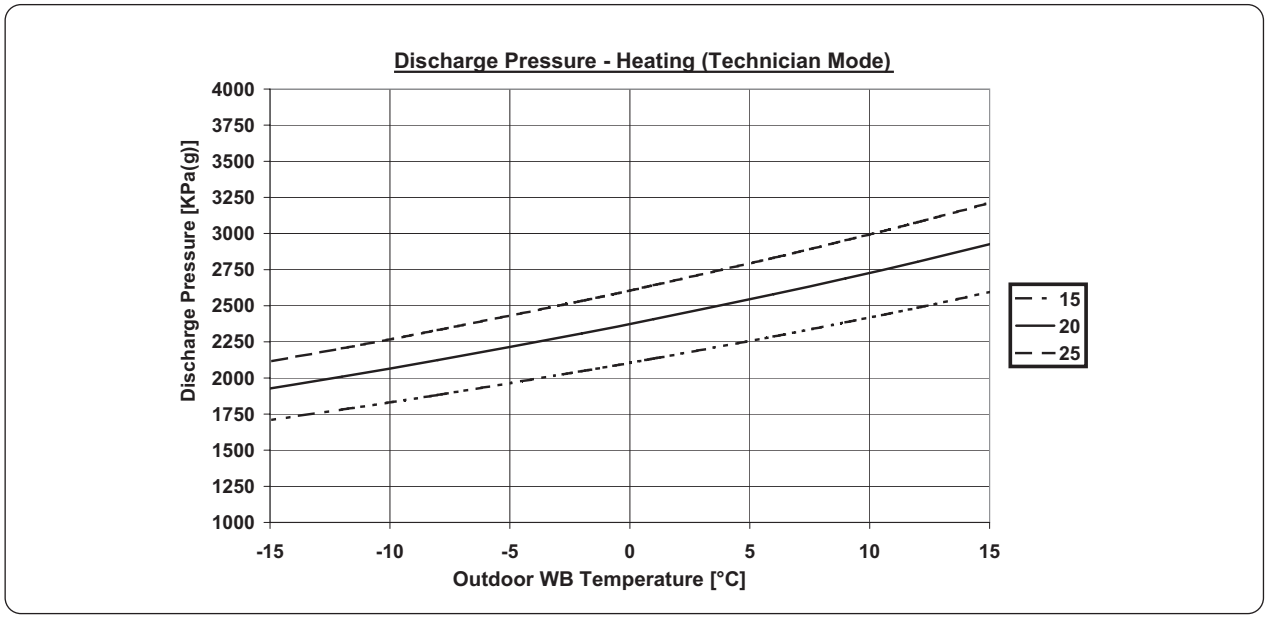
6.1.1 Cooling - Test Mode





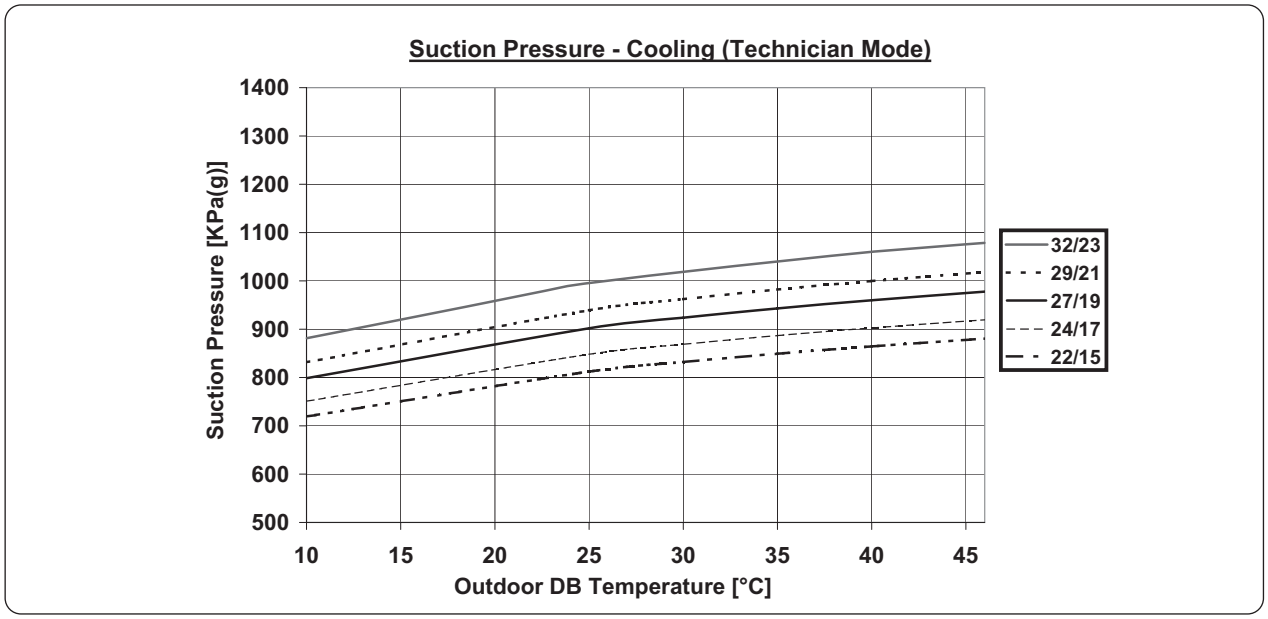
6.1.2 Heating - Test Mode

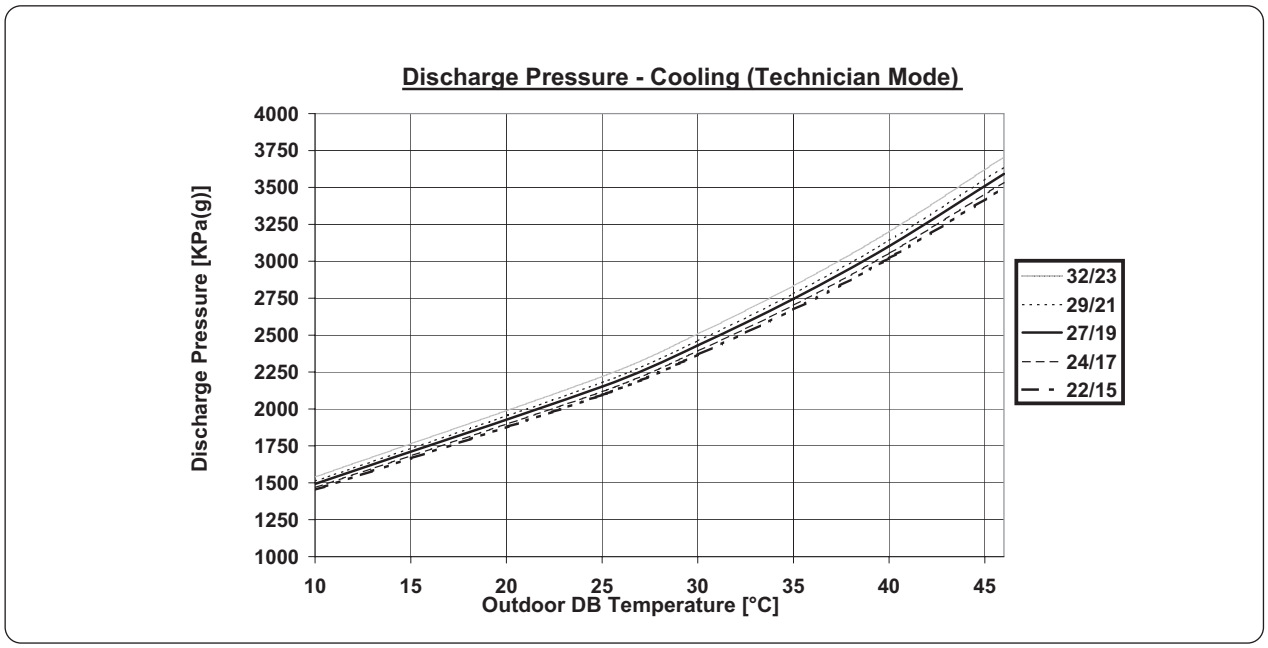




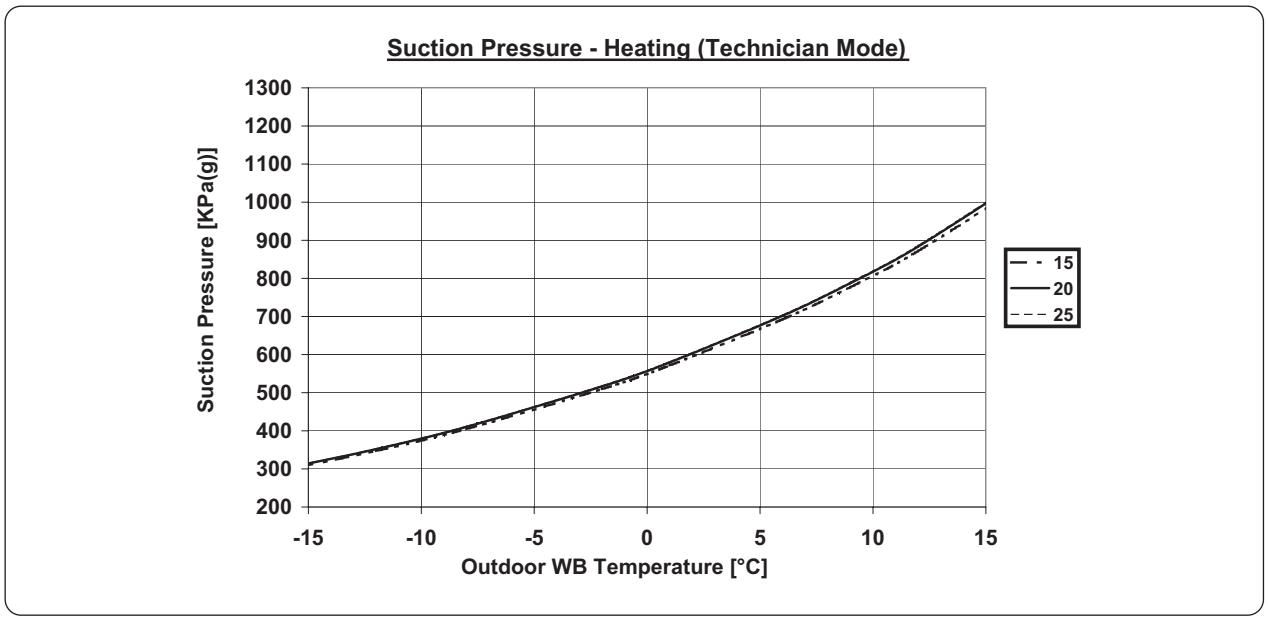
6.2 LSN 35 DCI

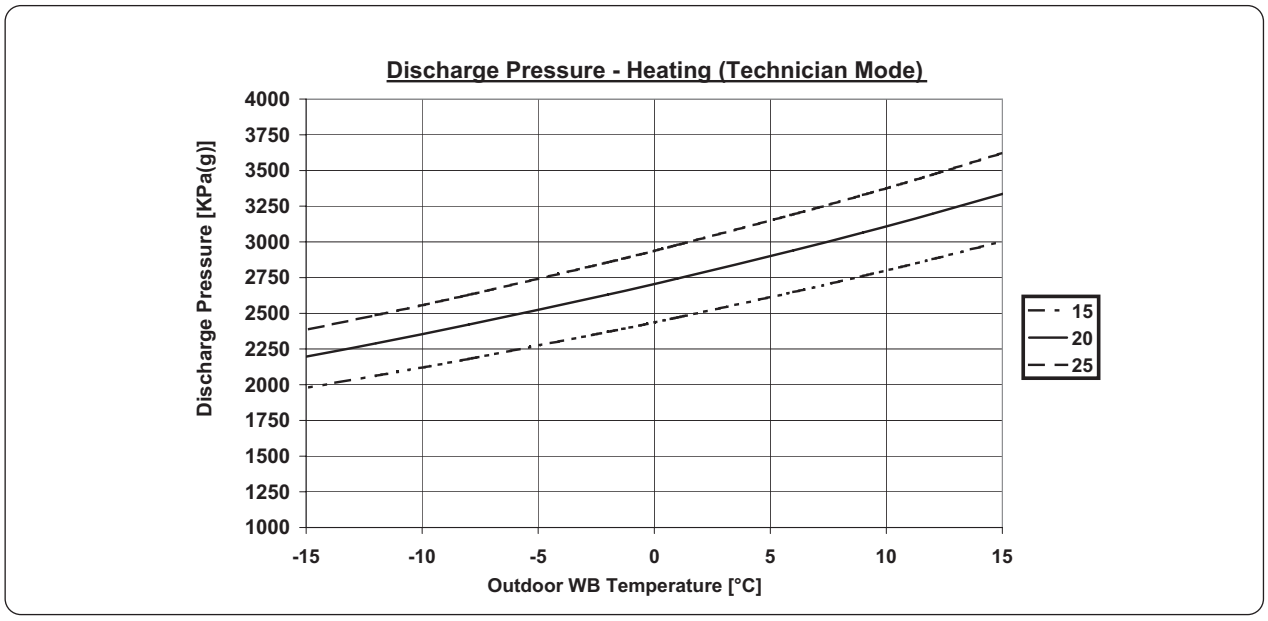
6.2.1 Cooling - Test Mode





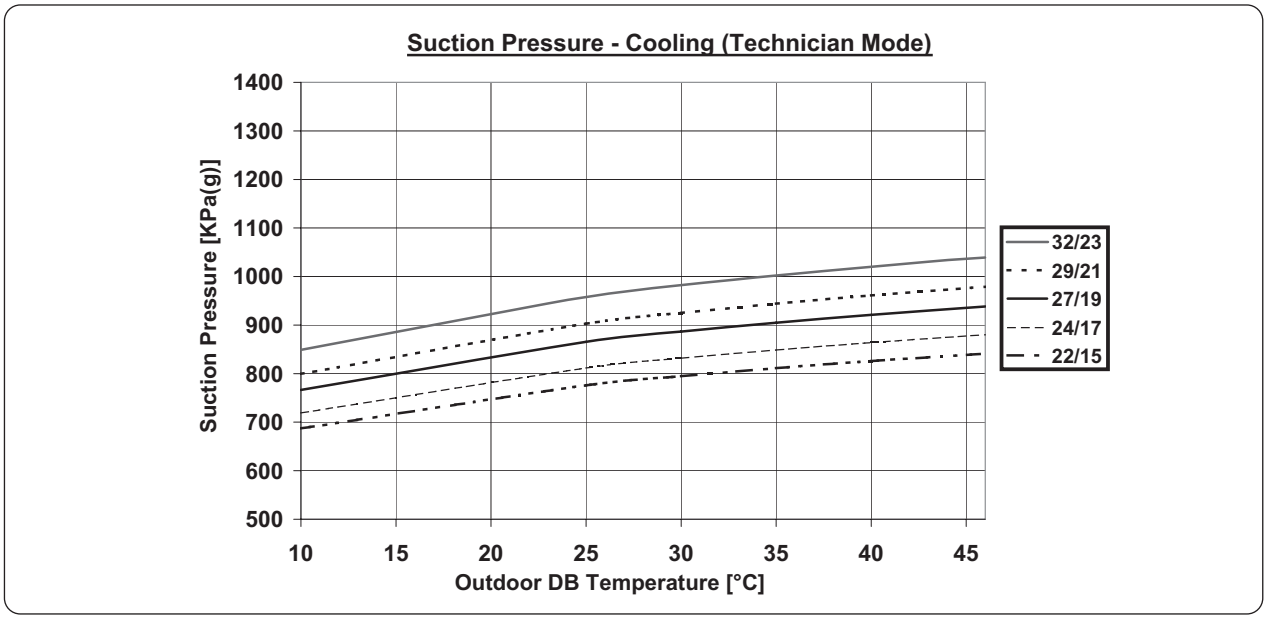
6.2.2 Heating - Test Mode

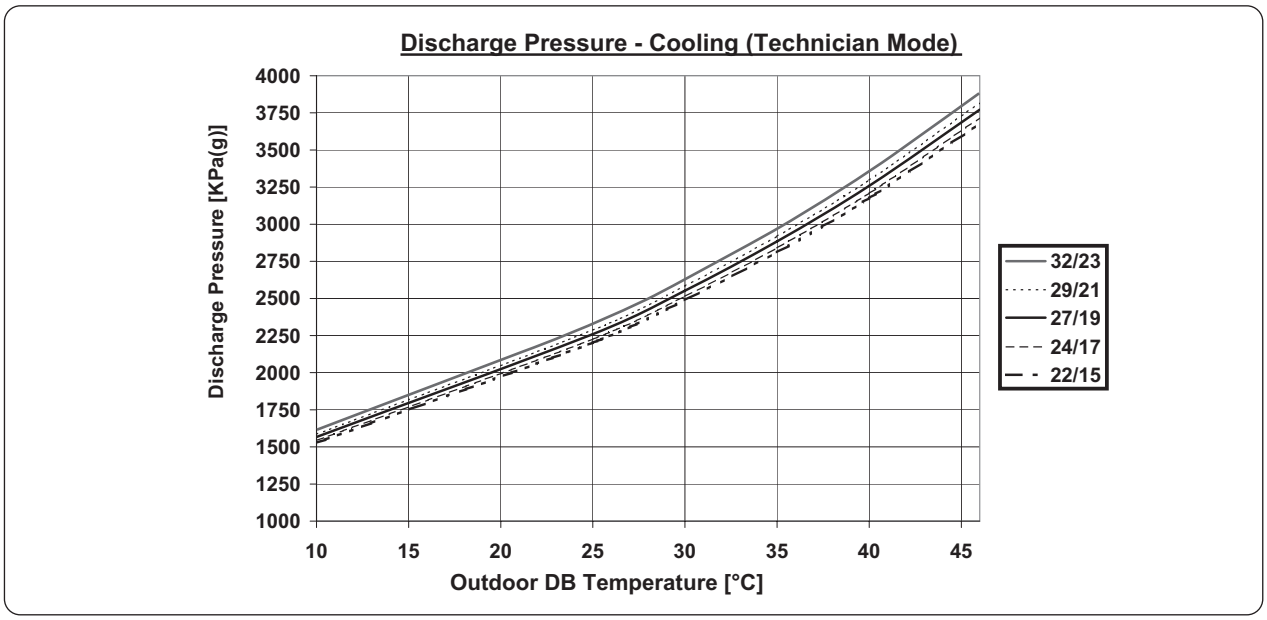




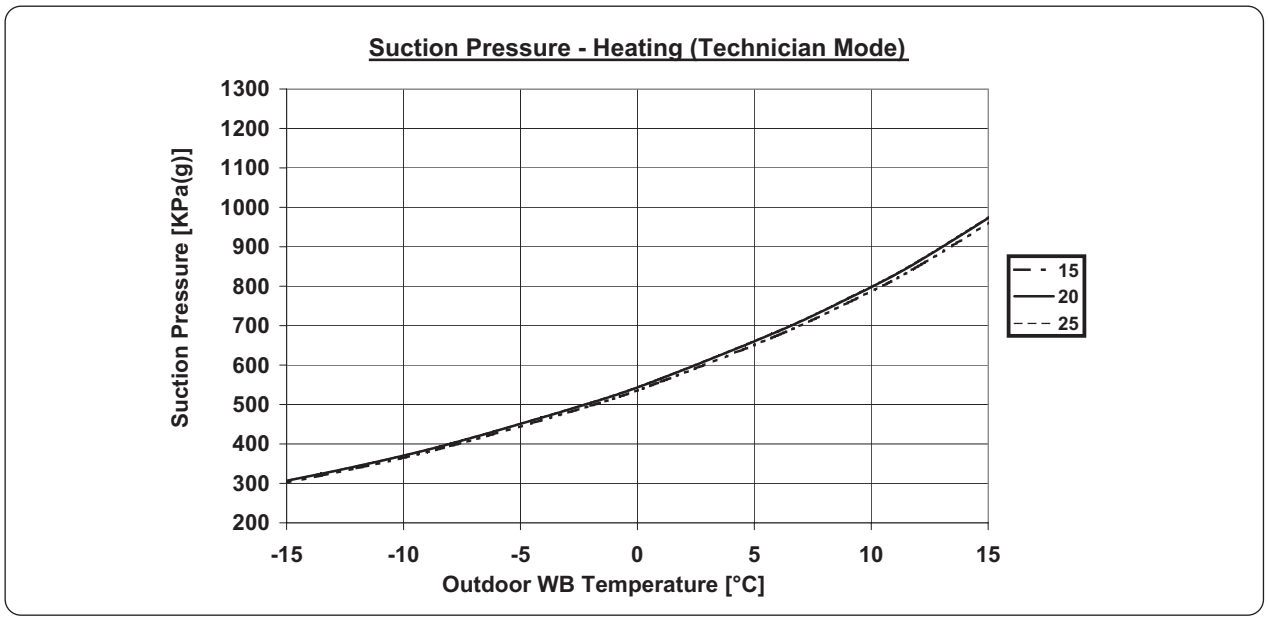
6.3 LSN 50 DCI

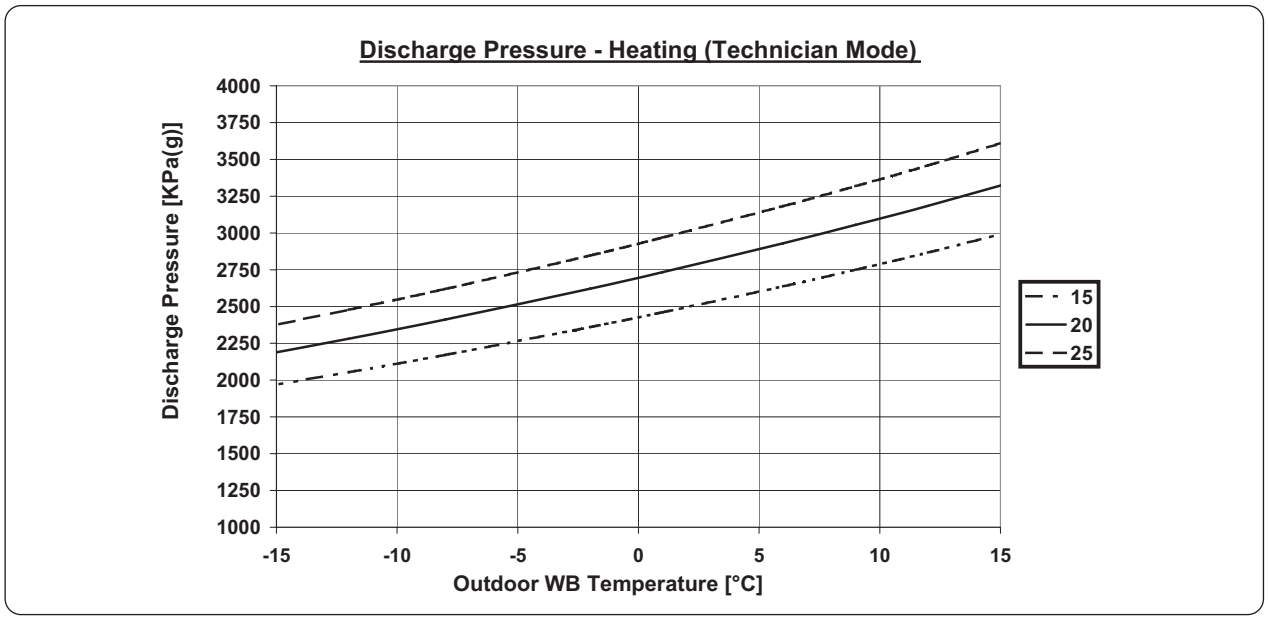
6.3.1 Cooling - Test Mode





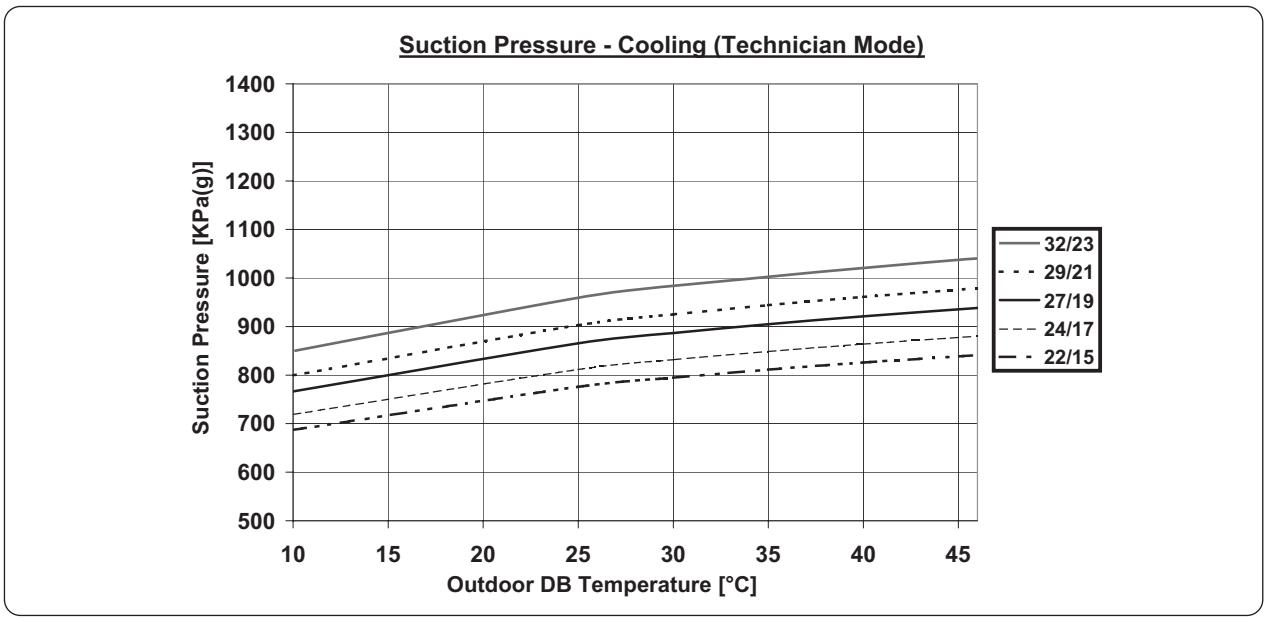
6.3.2 Heating - Test Mode

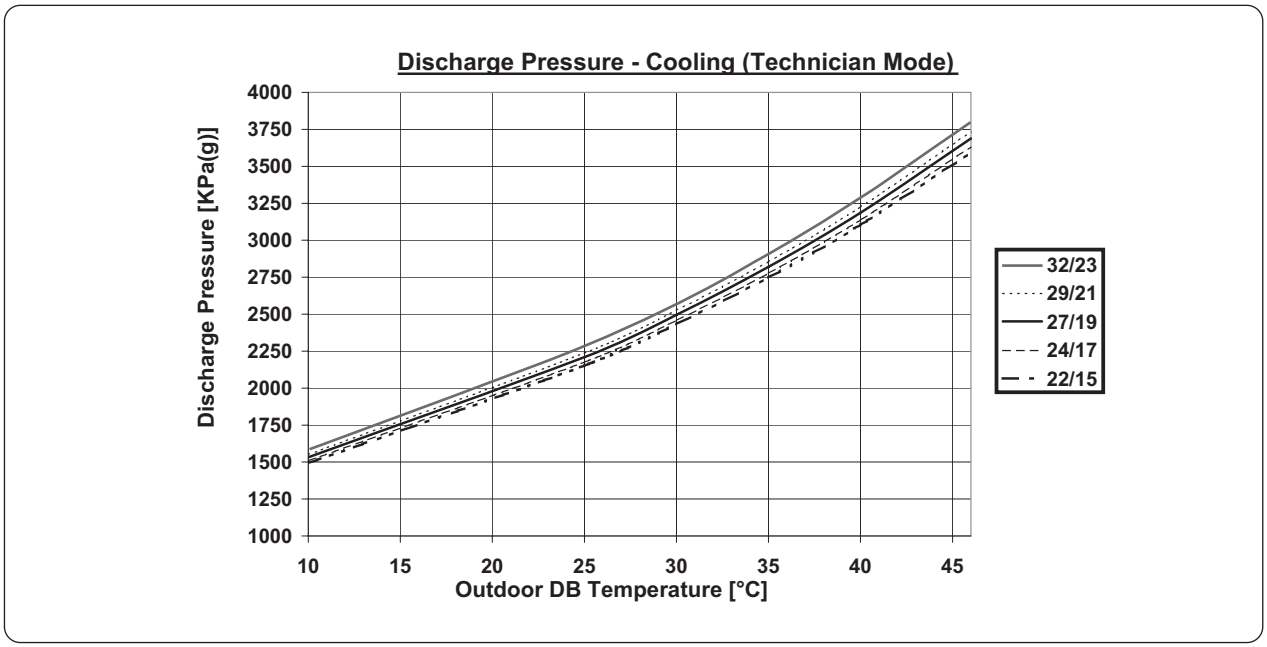




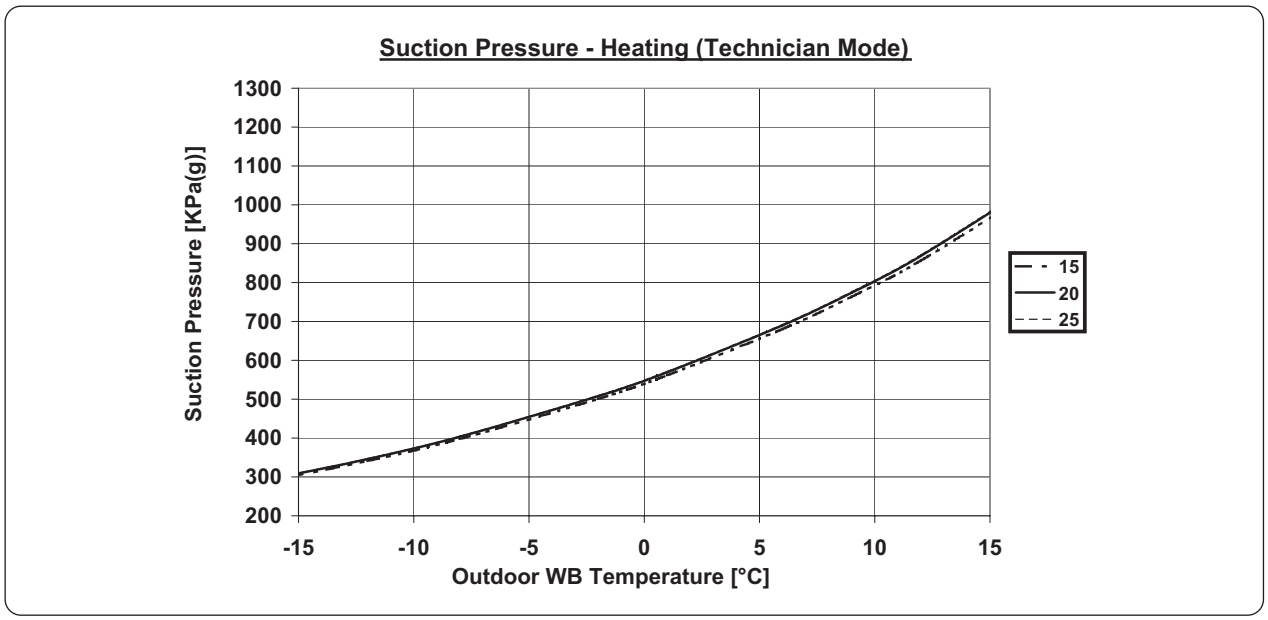
6.4 LSN 60 DCI

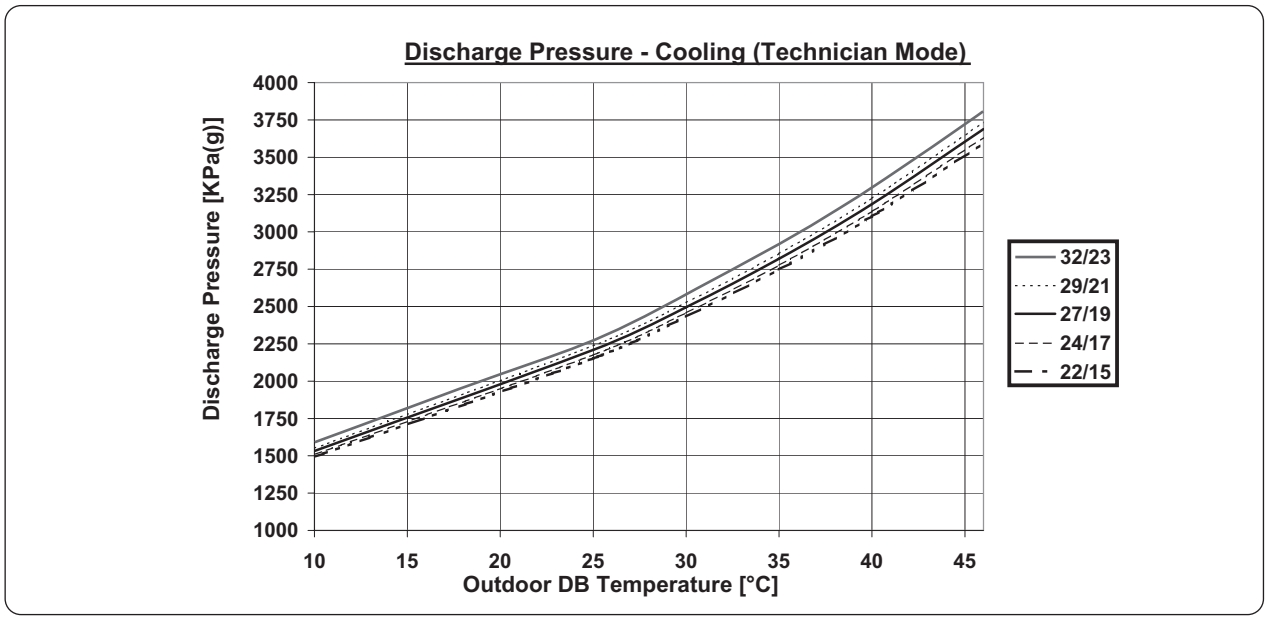
6.4.1 Cooling - Test Mode





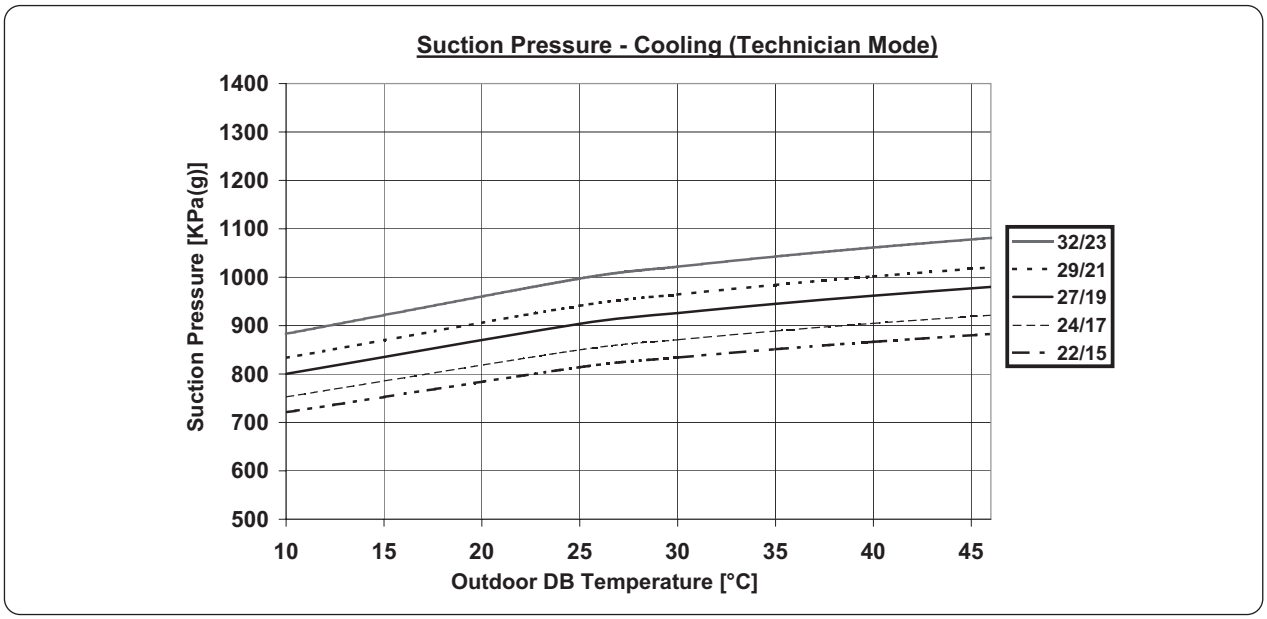
6.4.2 Heating - Test Mode

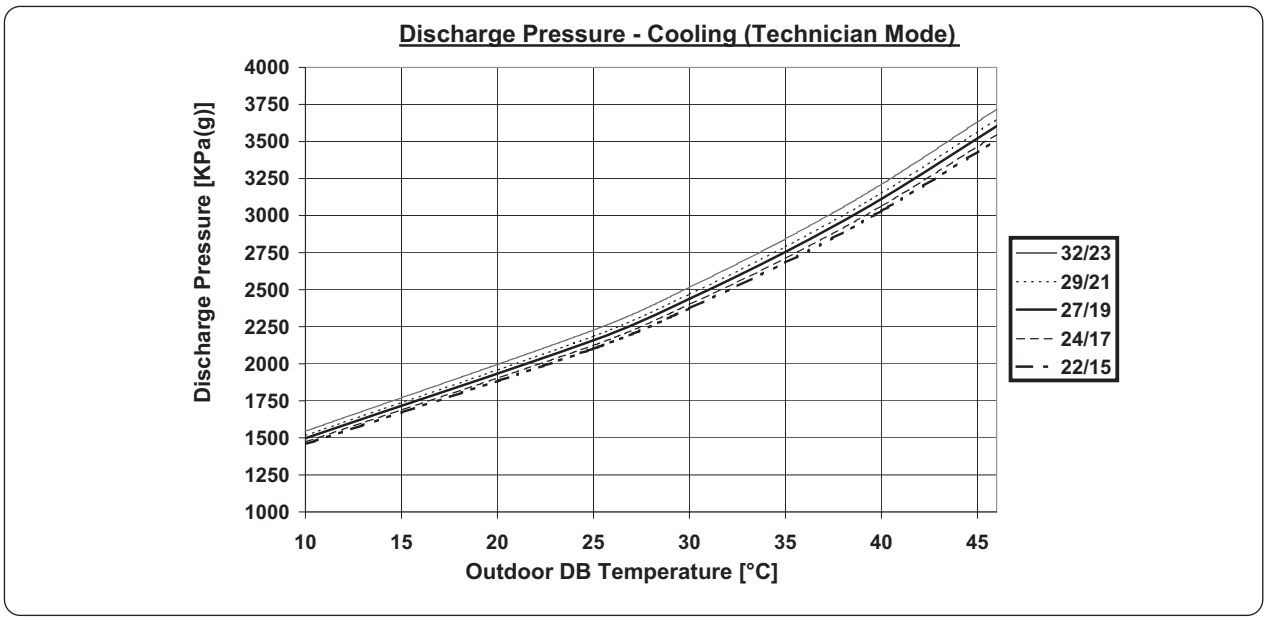




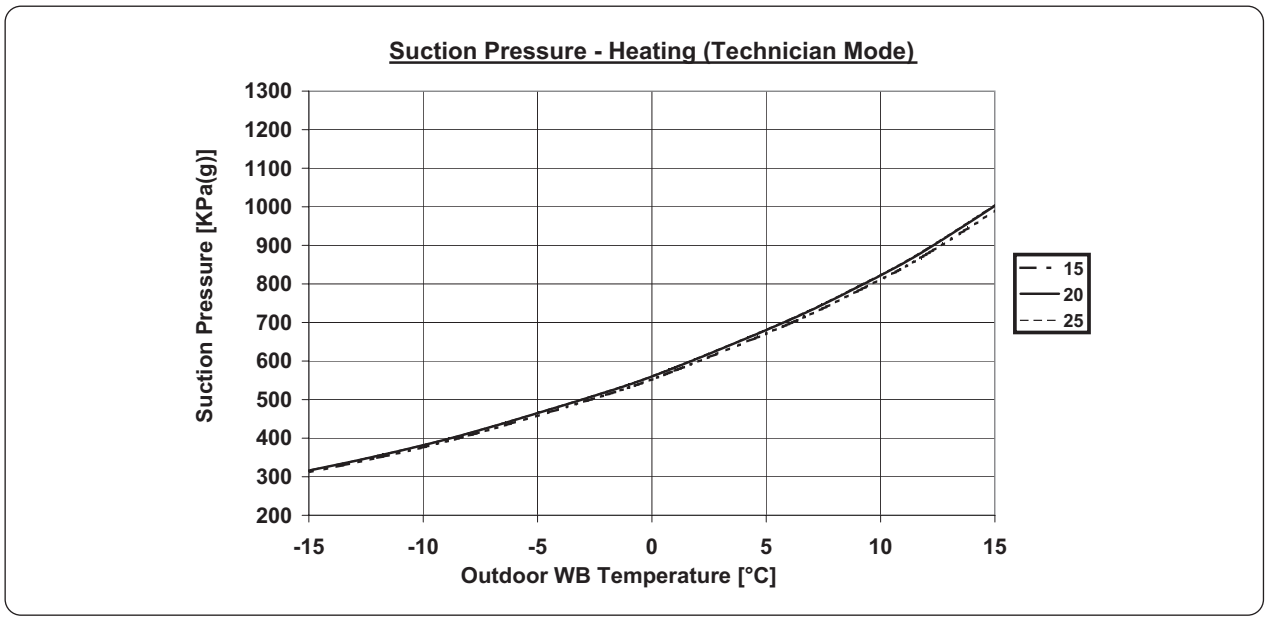
6.5 LSN 72 DCI

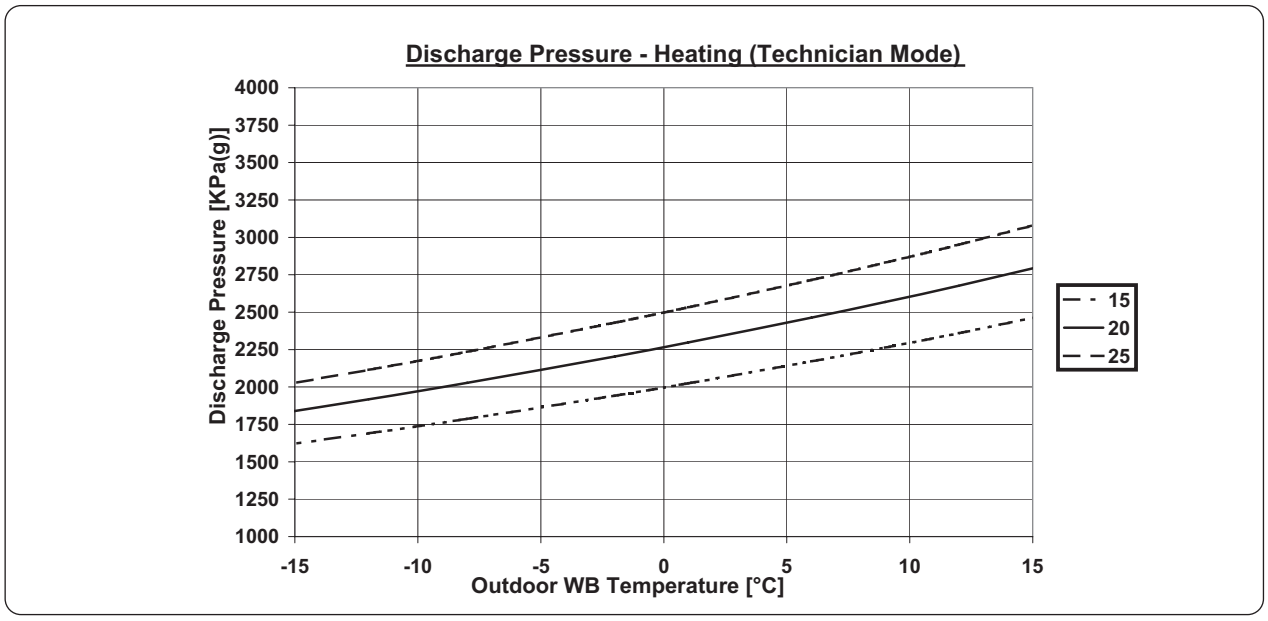
6.5.1 Cooling - Test Mode





6.5.2 Heating - Test Mode

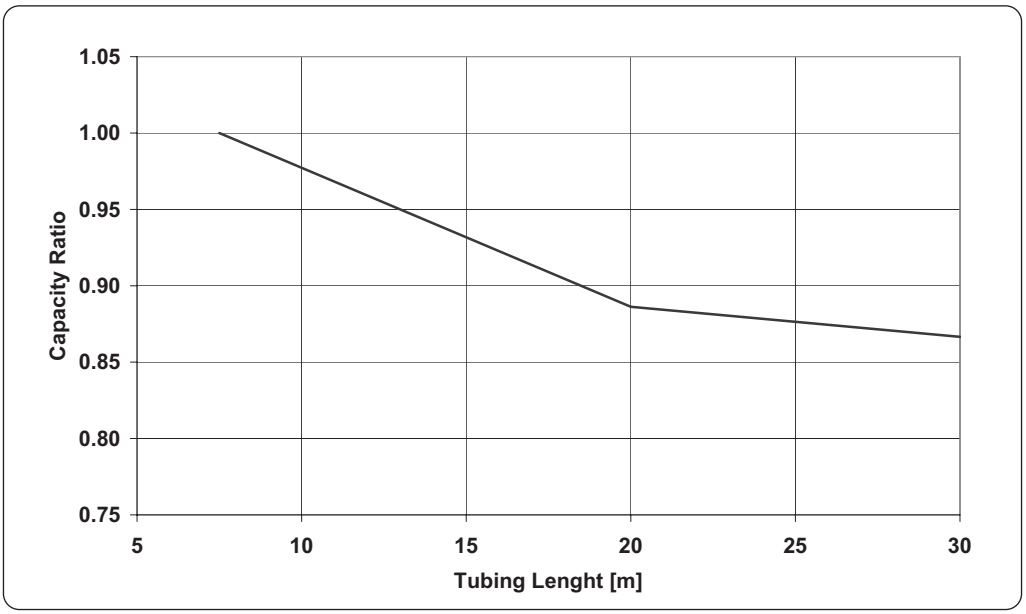




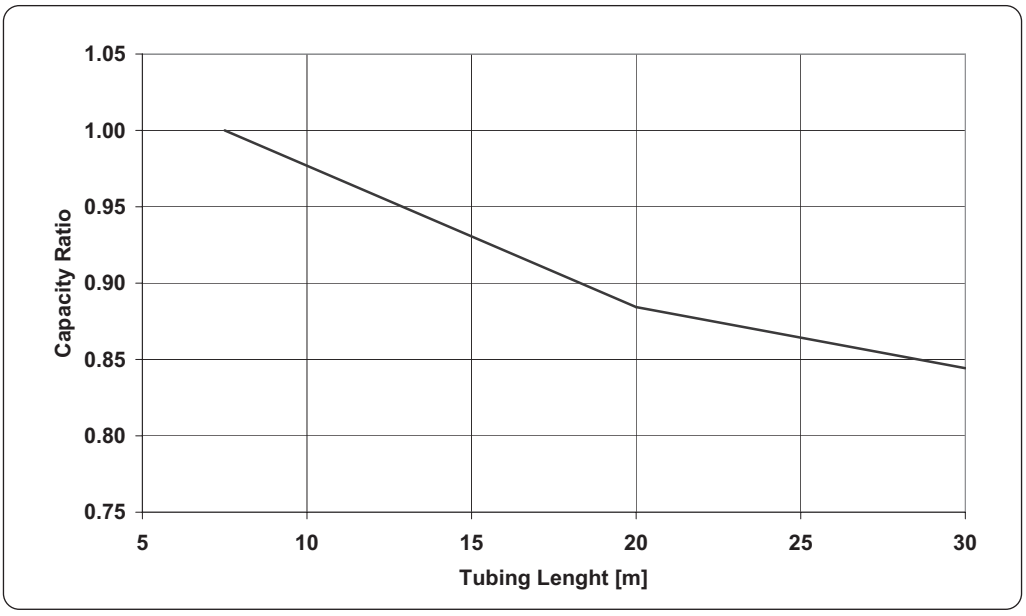
7. CORRECTION FACTOR

7.1 Capacity Correction Factor Due to Tubing Length

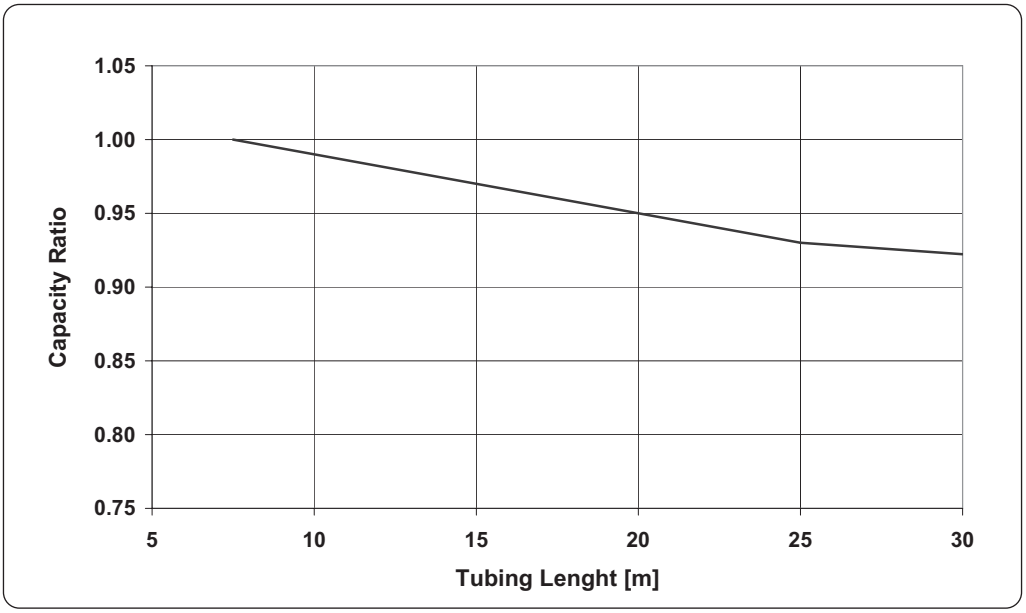
7.1.1 LSN 25 DCI: Cooling



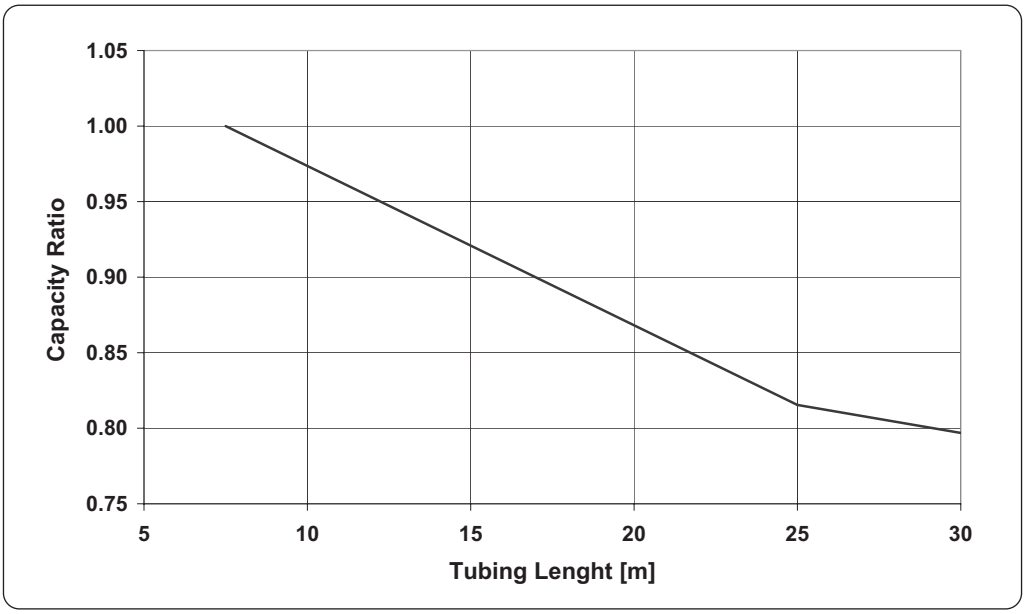
7.1.2 LSN 25 DCI: Heating



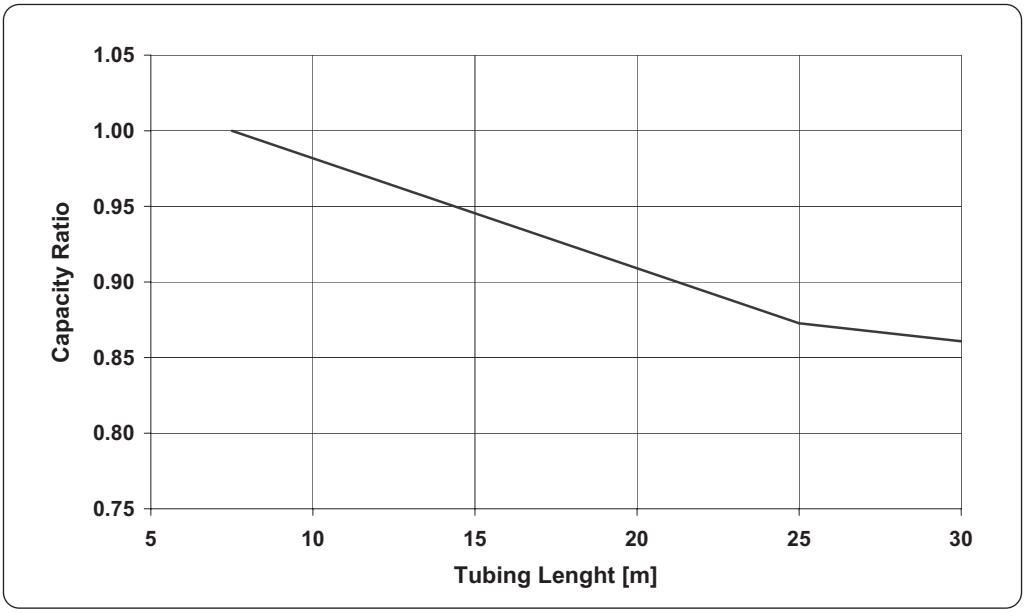
7.1.3 LSN 35 DCI: Cooling



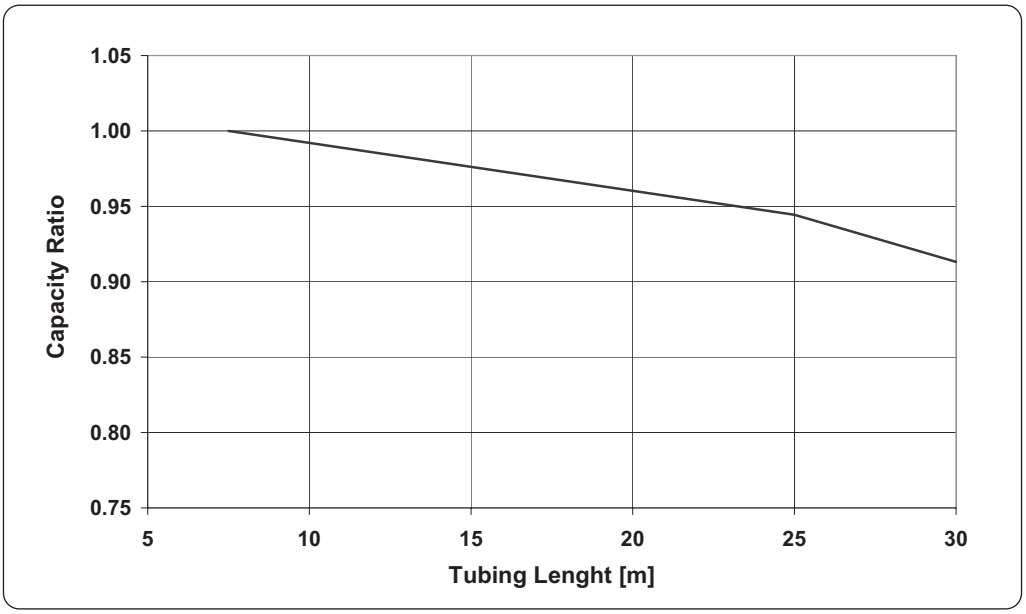
7.1.4 LSN 35 DCI: Heating



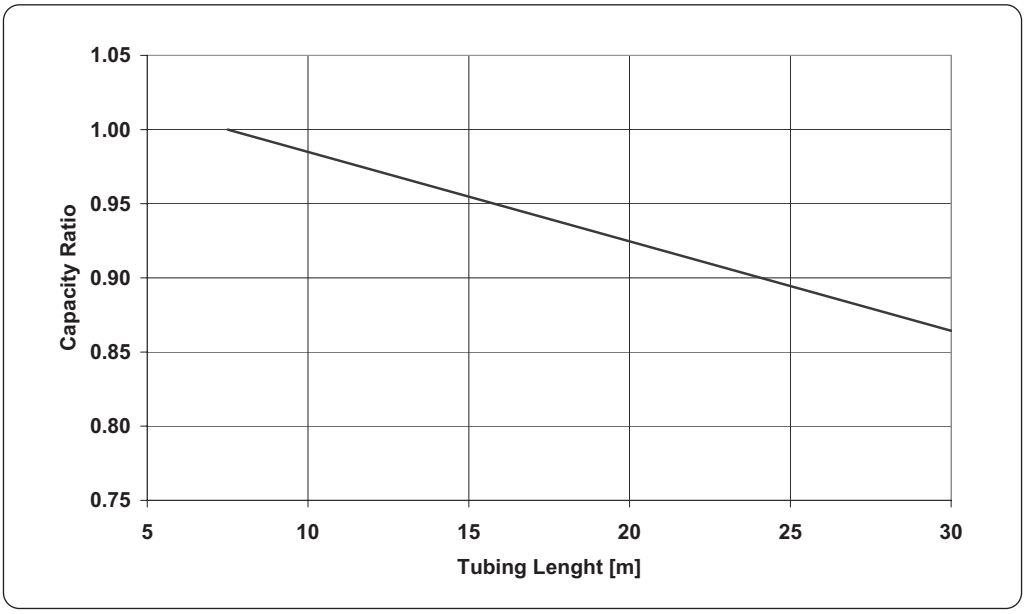
7.1.5 LSN 50 DCI: Cooling



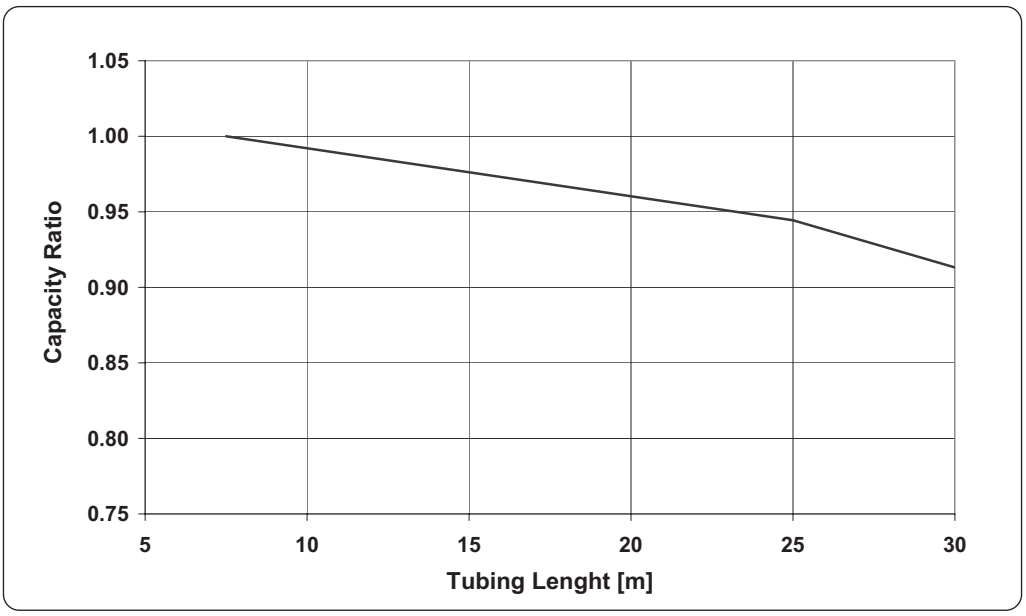
7.1.6 LSN 50 DCI: Heating



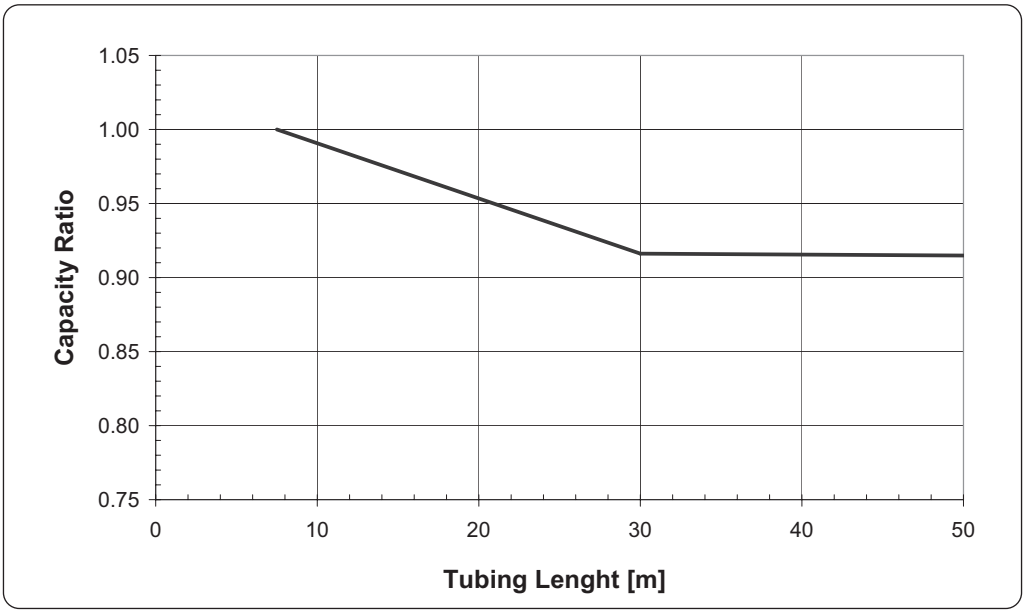
7.1.7 LSN 60 DCI: Cooling



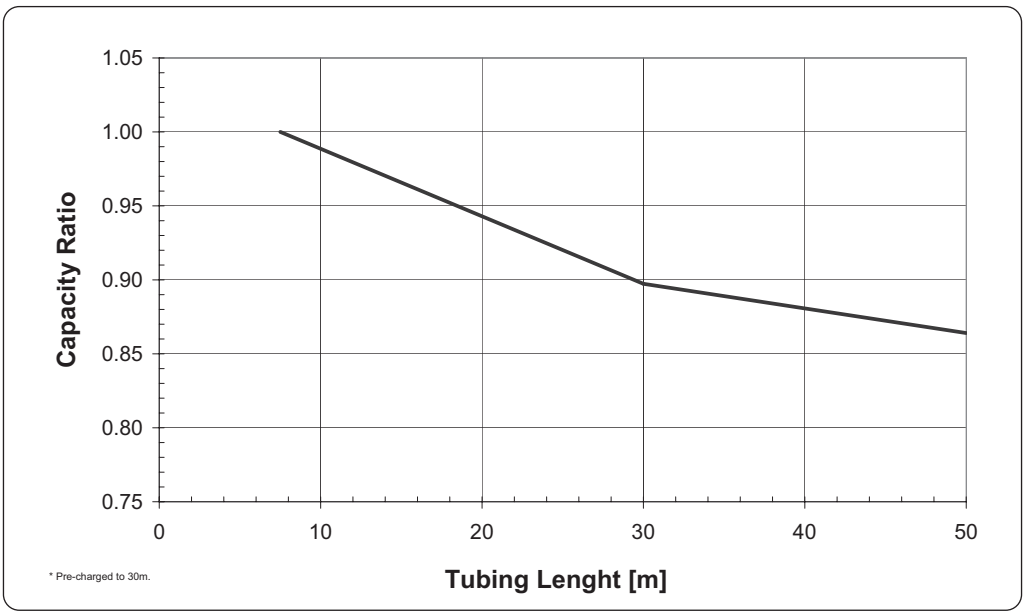
7.1.8 LSN 60 DCI: Heating



7.1.9 LSN 72 DCI: Cooling

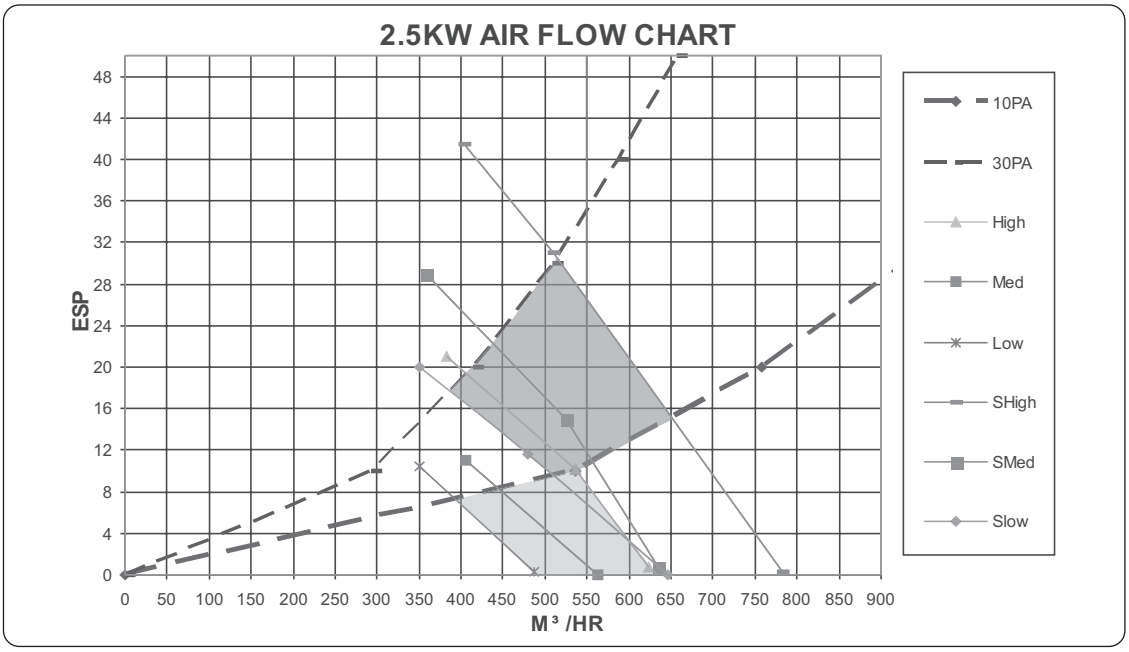


7.1.10 LSN 72 DCI: Heating

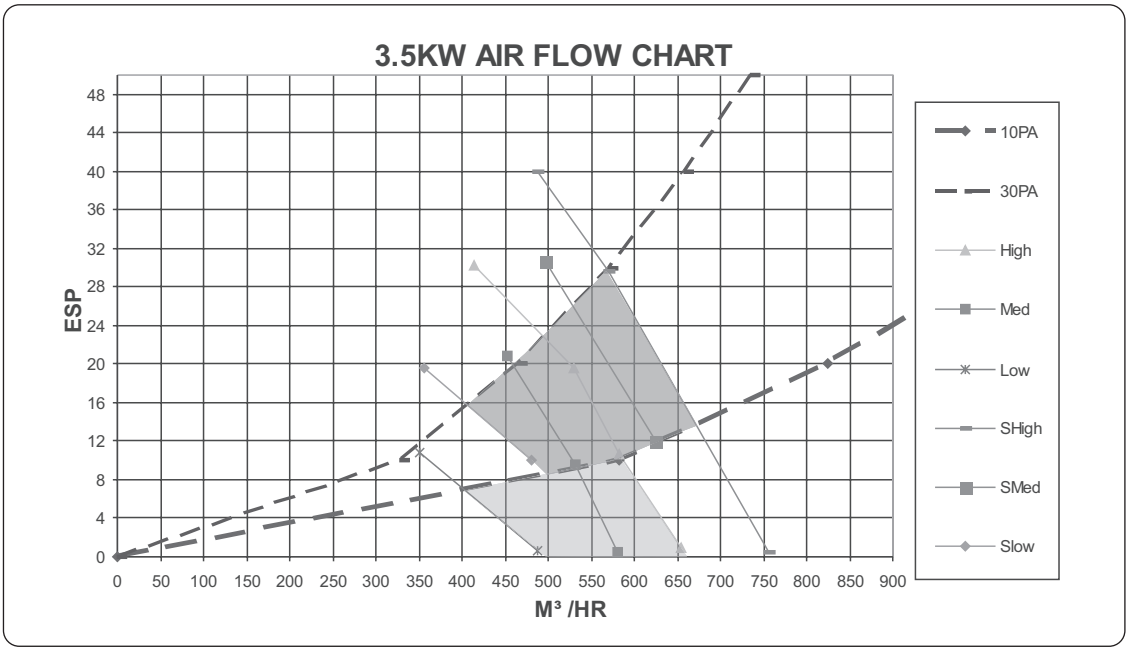


8. AIRFLOW CURVES

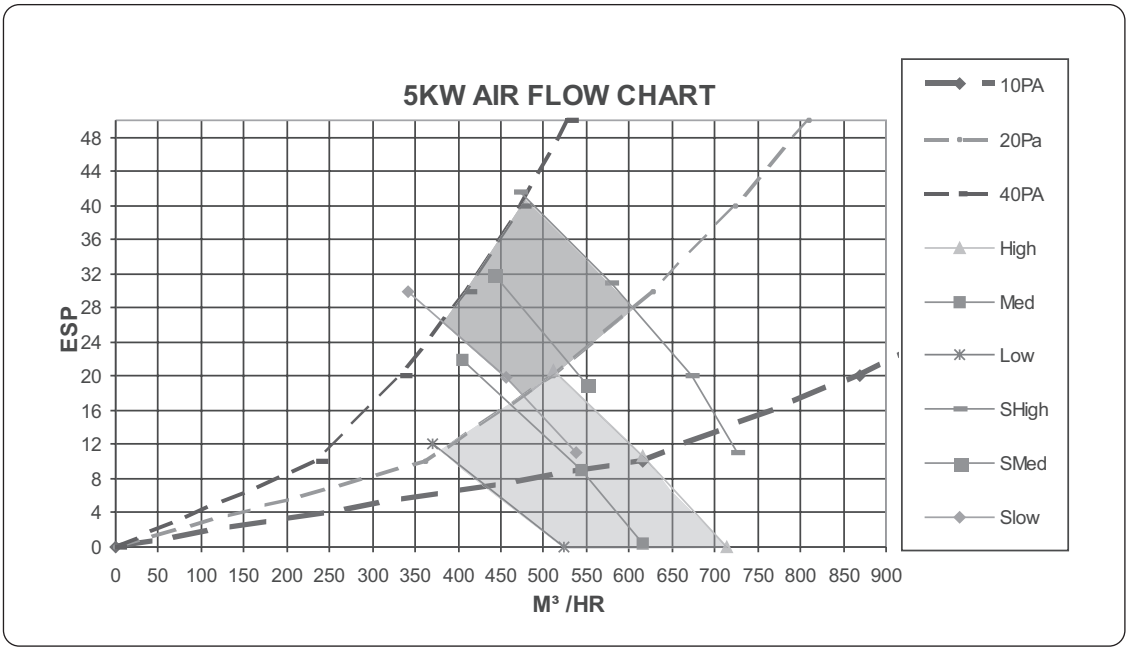
8.1 LSN 25 DCI



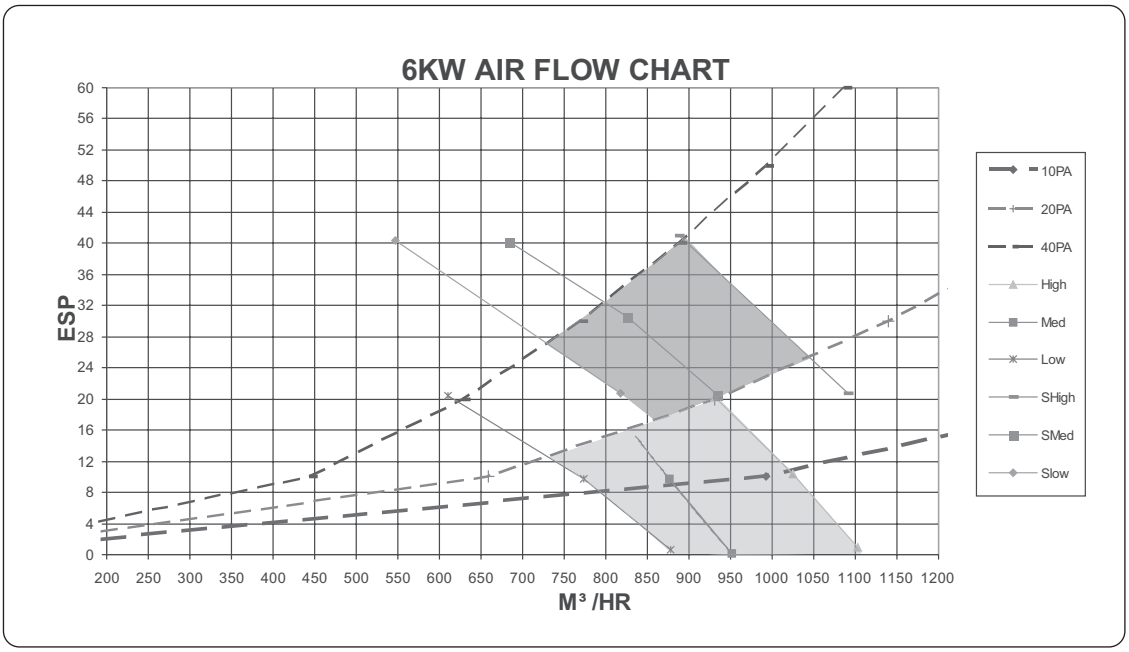
8.2 LSN 35 DCI



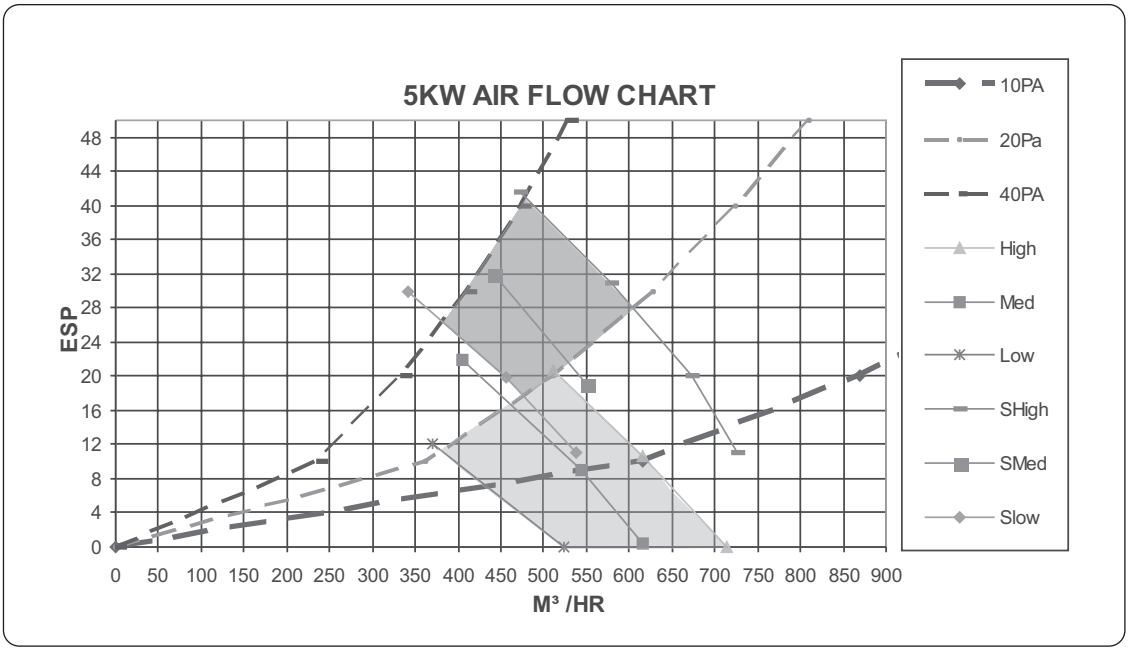
8.3 LSN 50 DCI



8.4 LSN 60 DCI



8.5 LSN 72 DCI



8.6 DLF Units Range Air Flow Correction Factors

At nominal rating conditions - Test mode

		Air Flow Rate [% of nominal]				
		60%	**70%**	**80%**	**90%**	**100%**
Cooling	TC	0.88	0.91	0.94	0.97	1
	SC	0.78	0.84	0.89	0.95	1
	PI	0.95	0.97	0.98	0.99	1
Heating	PI	1.07	1.05	1.03	1.02	1
	TC	0.90	0.92	0.95	0.97	1

9. SOUND LEVEL CHARACTERISTICS

9.1 Sound Pressure Level

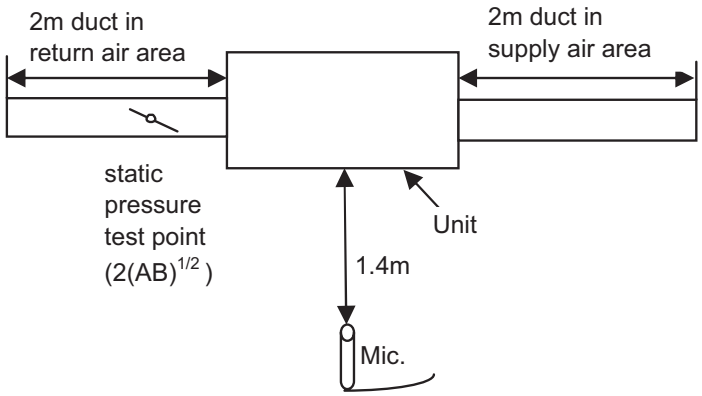
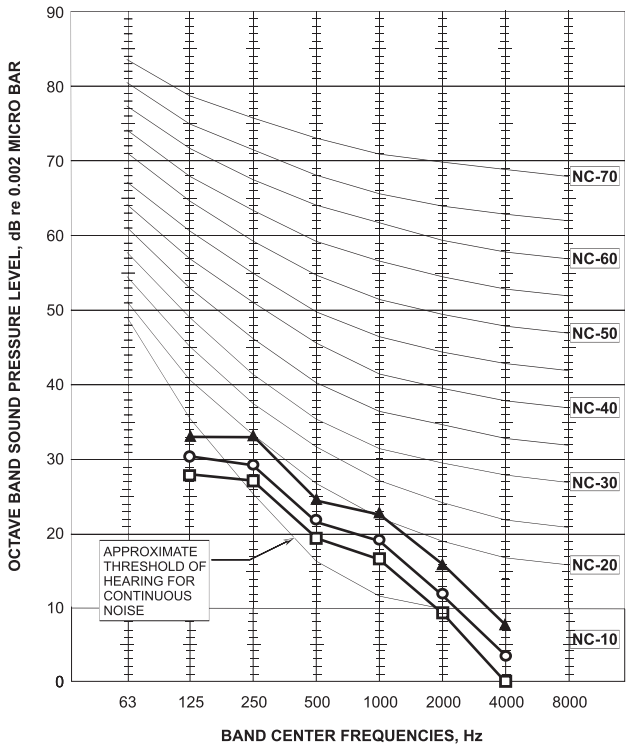


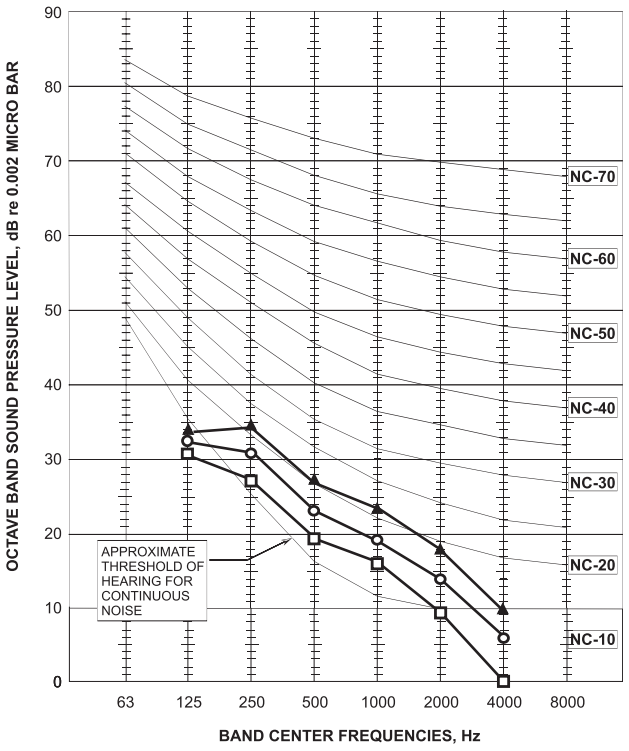
Figure 1

9.2 Sound Pressure Level Spectrum (Measured as Figure 1)

LSN 25 DCI

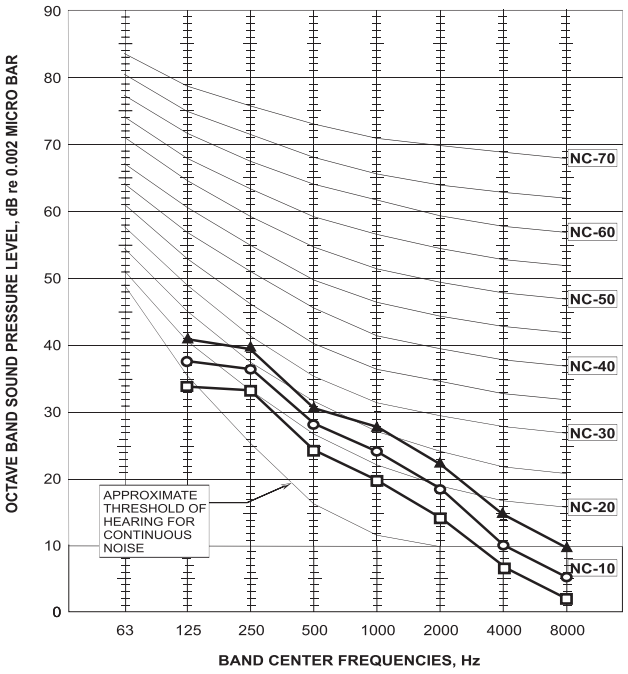


LSN 35 DCI

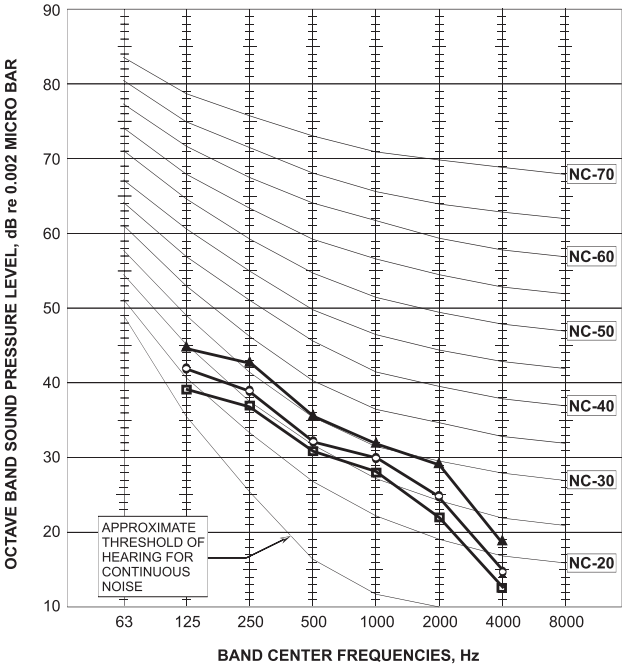


FAN SPEED	LINE
HI	▲
ME	○
LO	□

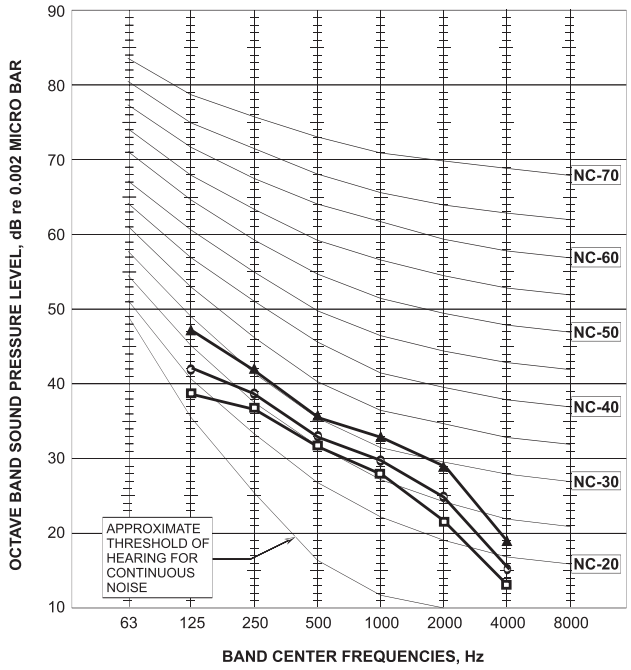
LSN 50 DCI



LSN 60 DCI



LSN 72 DCI



FAN SPEED	LINE
HI	▲—
ME	—○—
LO	—□—

9.3 Outdoor Units

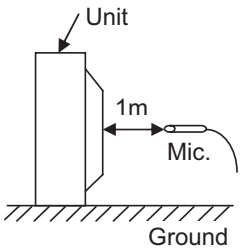
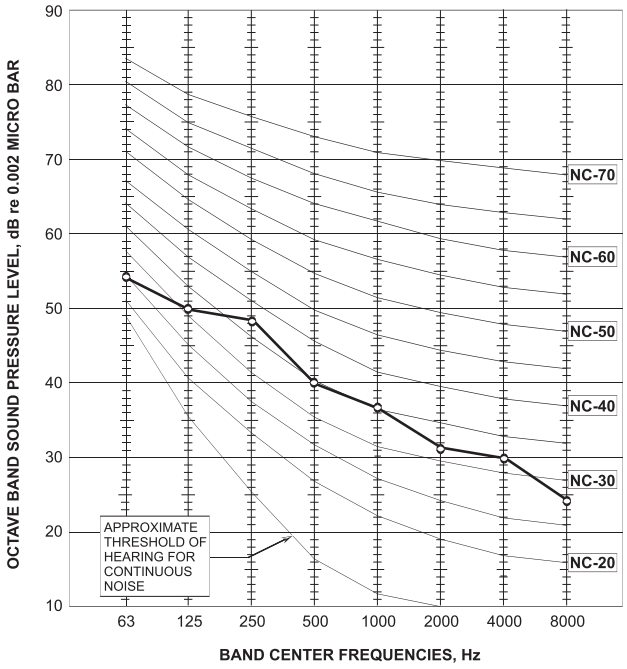


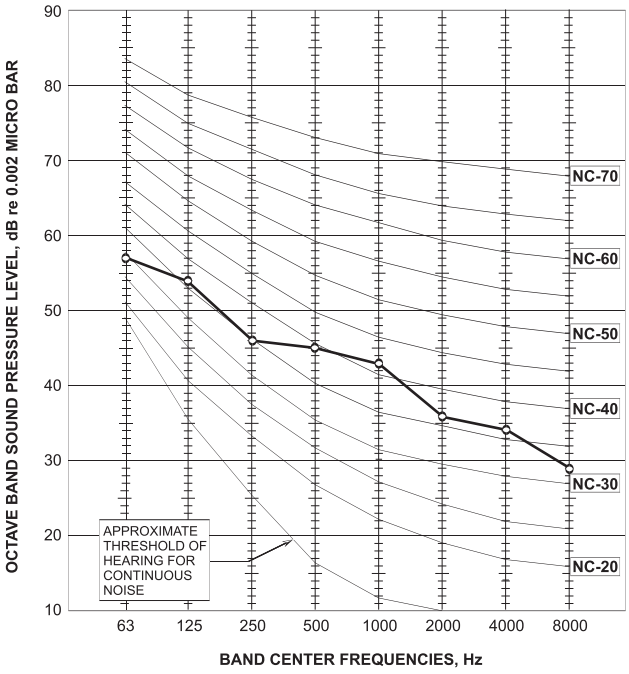
Figure 2

9.4 Sound Pressure Level Spectrum (Measured as Figure 2)

ONG 25 DCI Cooling

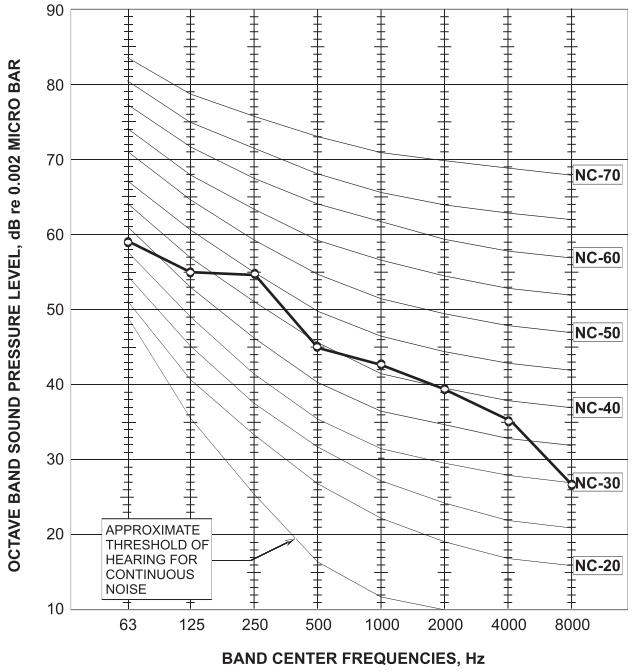


ONG 25 DCI Heating

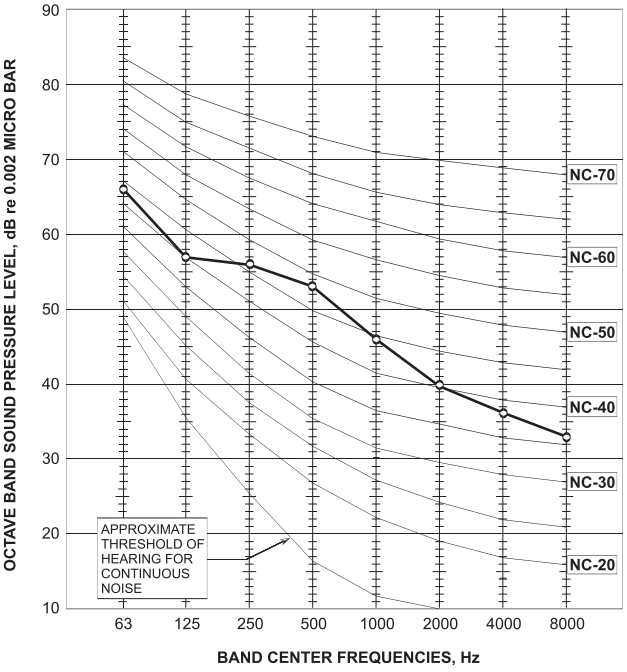


FAN SPEED	LINE
HI	▲—
ME	—○—
LO	—□—

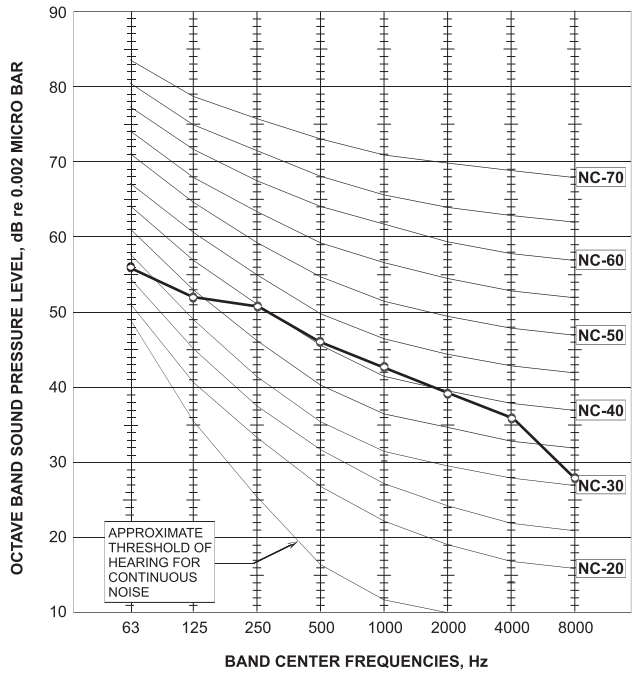
ONG 35 DCI Cooling



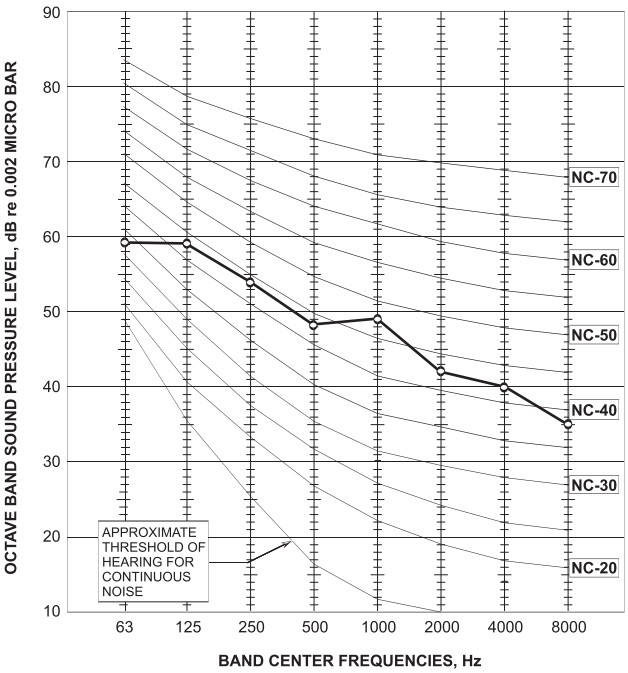
ONG 35 DCI Heating



ONG 50 DCI Cooling

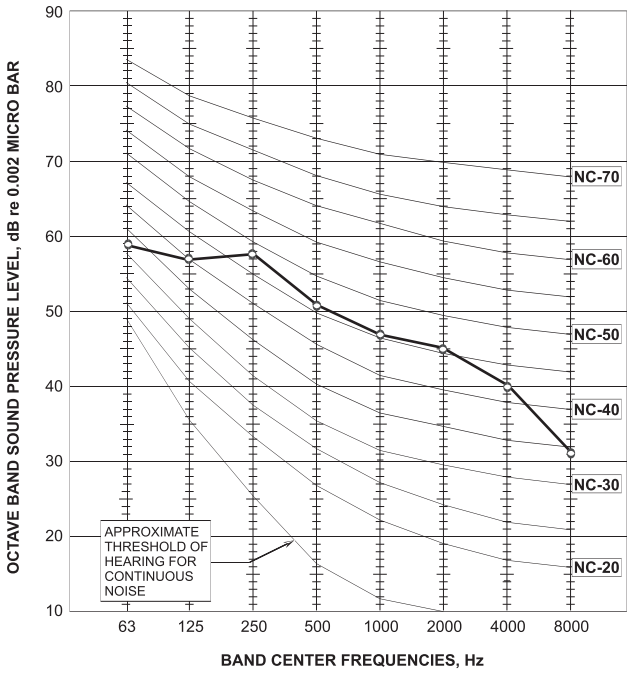


ONG 50 DCI Heating

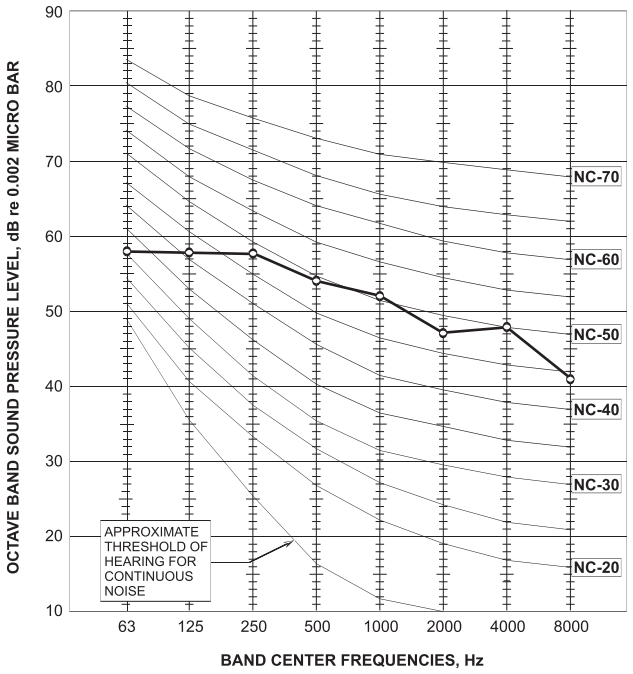


FAN SPEED	LINE
HI	▲
ME	○
LO	□

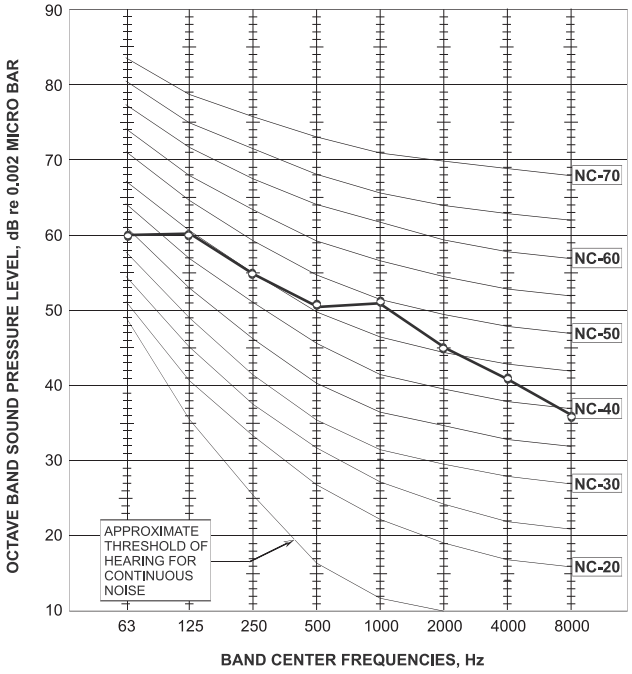
GC 60 DCI Cooling



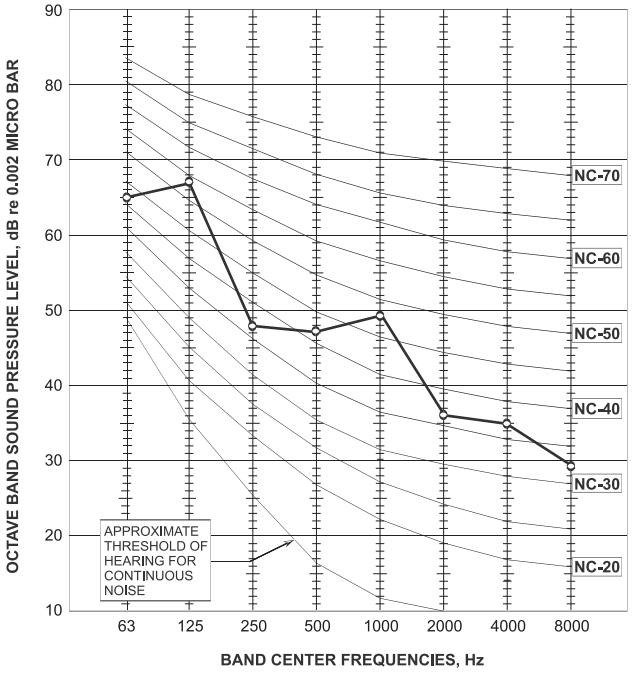
GC 60 DCI Heating



GC 72Z DCI Cooling



GC 72Z DCI Heating



FAN SPEED	LINE
HI	
ME	
LO	

10. ELECTRICAL DATA

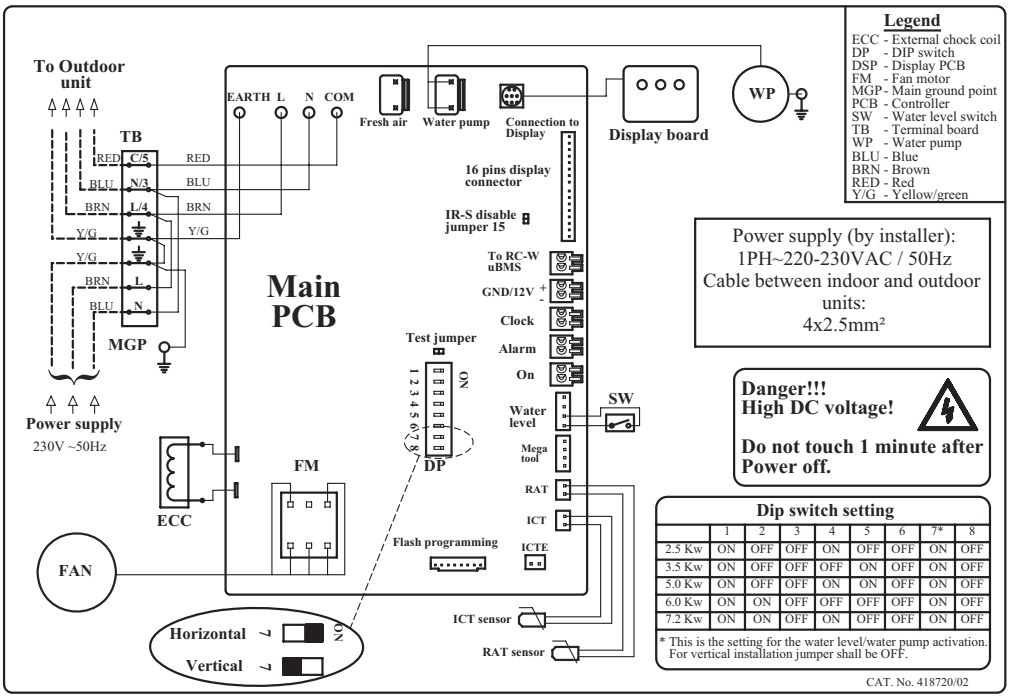
10.1 Single Phase Unit

Model	LSN 25-35 DCI	LSN 50-60 DCI	LSN 72 DCI
Power Supply	To Indoor	To Indoor or Outdoor	To Outdoor
	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz
Max Current, A	10.5	15	15
Circuit Breaker	16	20	20
Power Supply Wiring No. X Cross Section mm2	3 X 1.5 mm^2	3 X 2.5 mm^2	3 X 2.5 mm^2
Interconnecting Cable RC Model No. X Cross Section mm2	4 X 1.5 mm^2	4 X 2.5 mm^2	4 X 2.5 mm^2

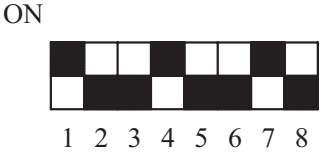
NOTE
Power wiring cord should comply with local lows and electrical regulations requirements.

11. WIRING DIAGRAMS

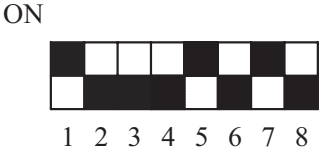
11.1 Indoor Unit: LSN 25, 35, 50, 60, 72 DCI



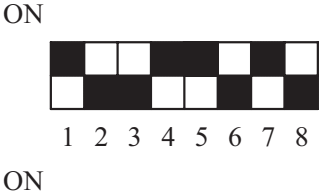
2.5 kW - 418960



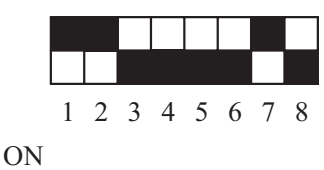
3.5 kW - 418961



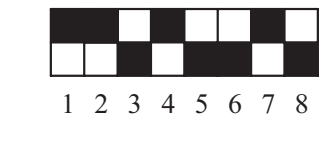
5.0 kW - 418962



6.0 kW - 418963

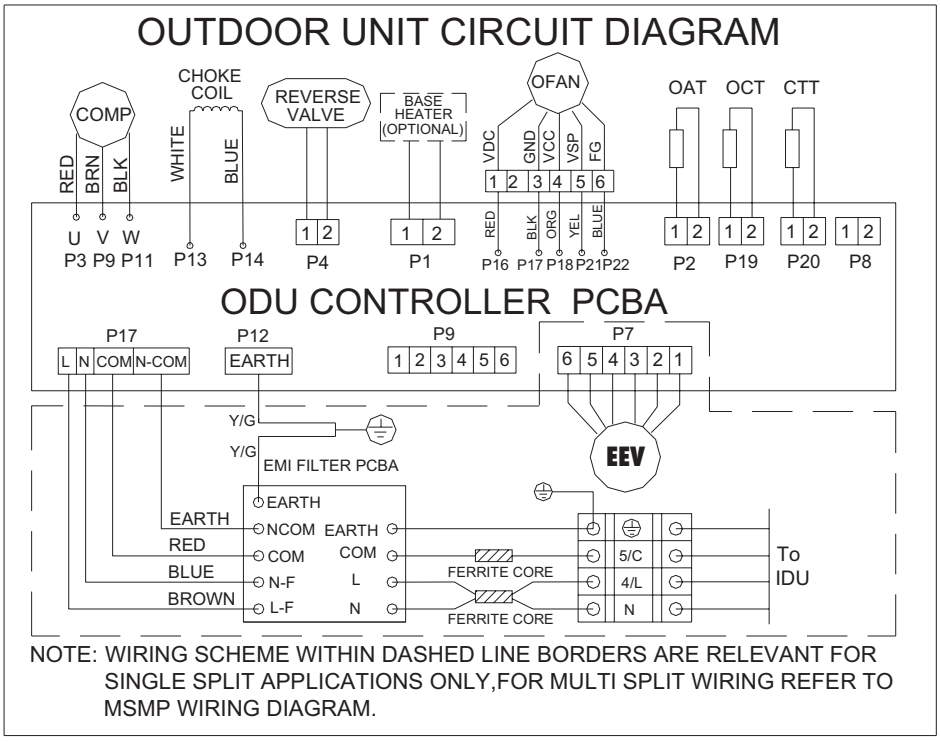


7.2 kW - 418964



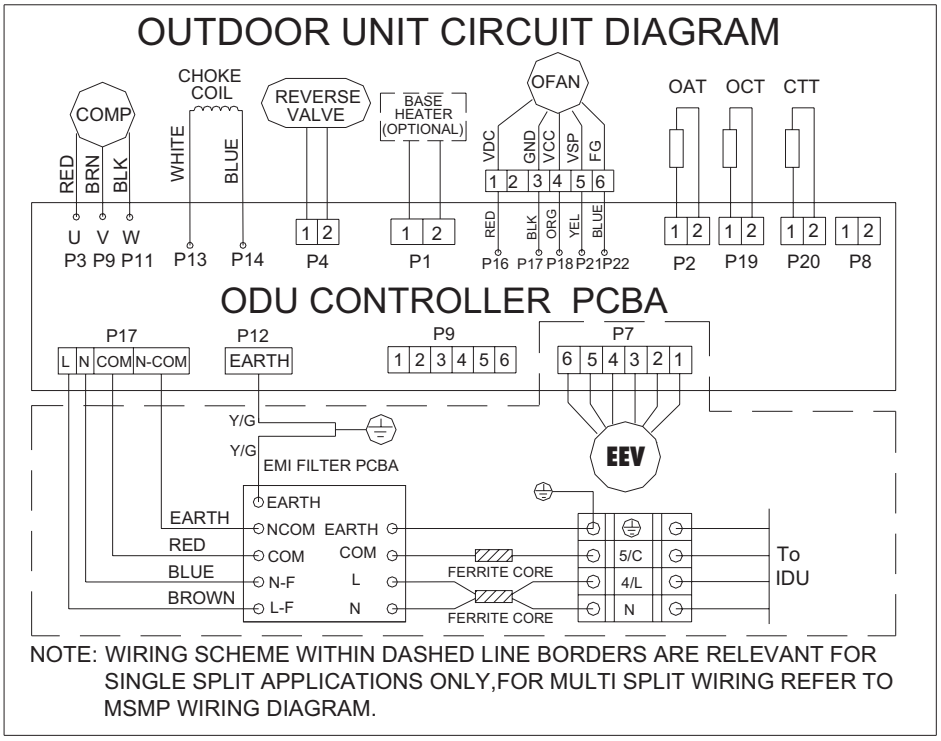
11.2 Outdoor Unit: ONG 25, 35, 50 DCI, GC 60 DCI

11.2.1 DCI 25, 35, 50, 60 for Indoor Power Supply



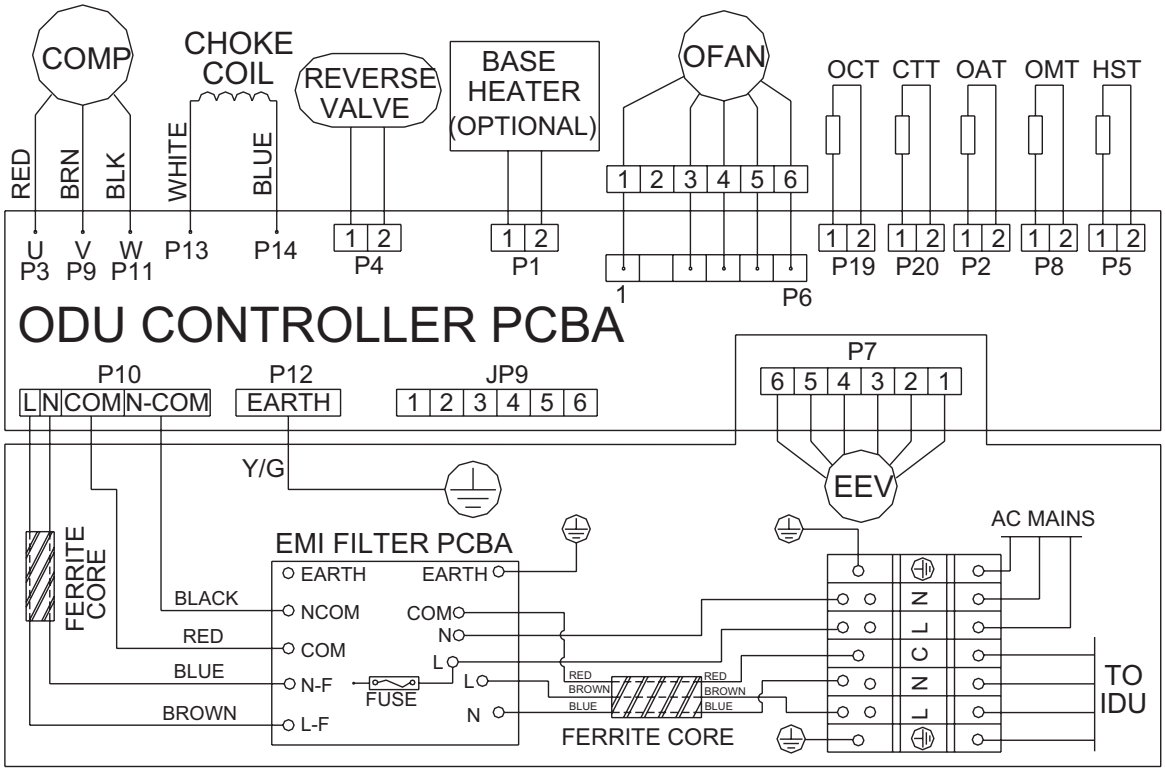
NOTE: WIRING SCHEME WITHIN DASHED LINE BORDERS ARE RELEVANT FOR SINGLE SPLIT APPLICATIONS ONLY,FOR MULTI SPLIT WIRING REFER TO MSMP WIRING DIAGRAM.

11.2.2 DCI 25, 35, 50, 60 for Outdoor Power Supply



NOTE: WIRING SCHEME WITHIN DASHED LINE BORDERS ARE RELEVANT FOR SINGLE SPLIT APPLICATIONS ONLY,FOR MULTI SPLIT WIRING REFER TO MSMP WIRING DIAGRAM.

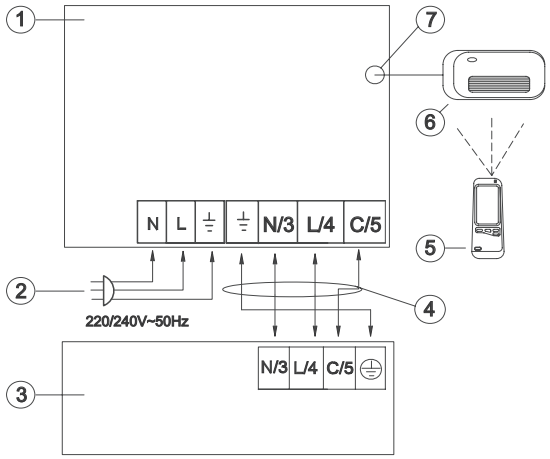
11.3 Outdoor Units: GC 72Z DCI



12. ELECTRICAL CONNECTIONS

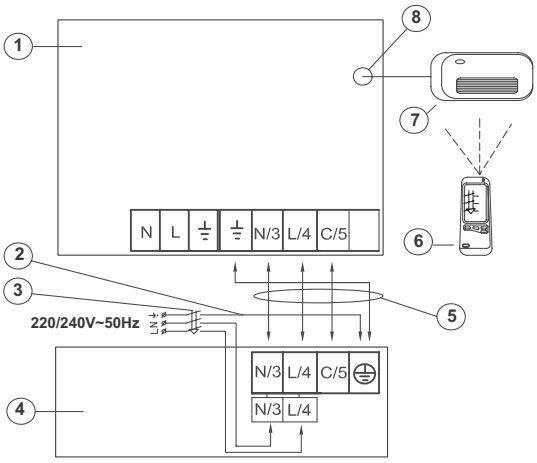
12.1 LSN 25, 35, 50 1PH

1. Indoor Unit
2. Power Supply Cable
3. Outdoor Unit
4. Interconnecting Cable:
2.5-3.5KW (4x1.5mm2)
5.0-6.0KW (4x2.5mm2)
5. Wireless Remote Control
6. Display Unit
7. Display Connector



12.2 LSN 60, 72 1PH

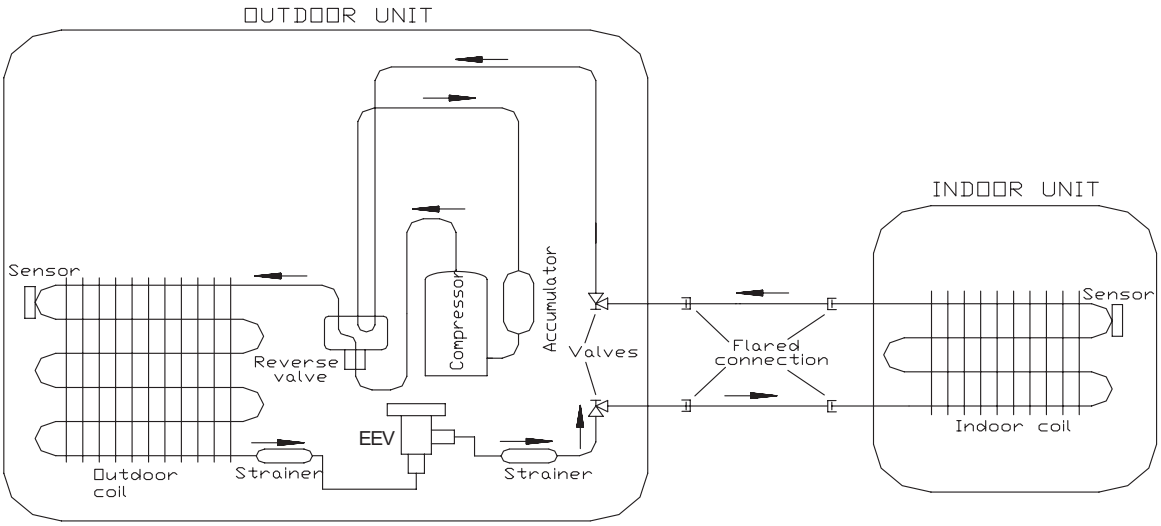
1. Indoor Unit
2. Power Supply Cable
3. Power breaker (by installer)
4. Outdoor Unit
5. Interconnecting Cable (4x2.5mm2)
6. Wireless Remote Control
7. Display Unit
8. Display Connector



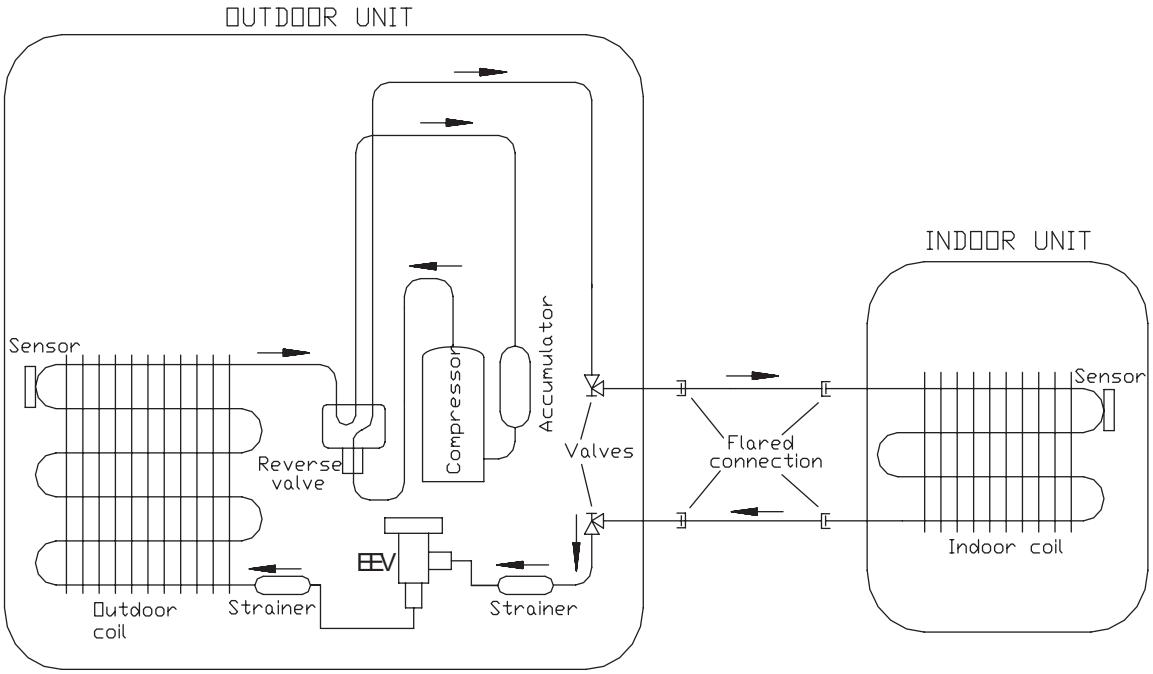
13. REFRIGERATION DIAGRAMS

13.1 Heat Pump Models

13.1.1 LSN 25, 35, 50, 60, 72 DCI: Cooling Mode



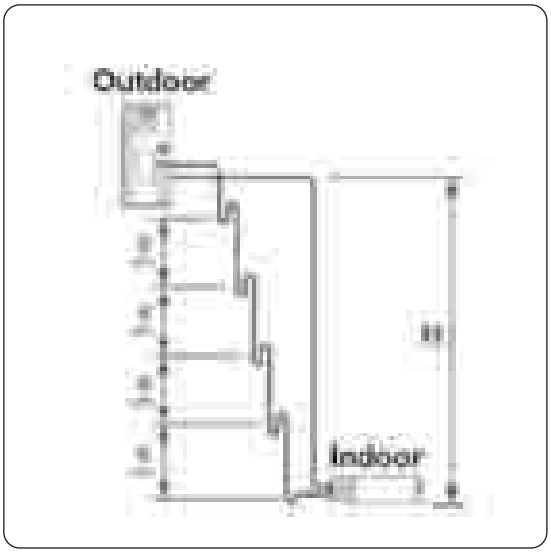
13.1.2 LSN 25, 35, 50, 60, 72 DCI: Heating Mode



14. TUBING CONNECTIONS

Torque (Nm) \ Tube (inch)	1/4”	3/8”	1/2”	5/8”	3/4”
Flare Nuts	15-18	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

1. Valve Protection Cap-end
2. Refrigerant Valve Port (use Allen wrench to open/close)
3. Valve Protection Cap
4. Refrigerant Valve
5. Service Port Cap
6. Flare Nut
7. Unit Back Side
8. Copper Tube



When the outdoor unit is installed adove the indoor unit an oil trap is requiered every 5m along the suction line at the lowest point of the riser. Incase the indoor unit is installed adobe the outdoor, no trap is required.

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